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Survey and Assessment of Atmospheric Odor  
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# Survey and Assessment of Atmospheric Odor in the Edmonton Area

FEBRUARY, 1973

Prepared by Stanley Associates Engineering Ltd.  
Consulting Engineers and Planners



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# Survey and Assessment of Atmospheric Odor in the Edmonton Area

a report commissioned by the  
honourable W.J. YURKO, minister  
of the Alberta Department of  
the Environment

PREPARED BY



Stanley Associates  
Engineering Ltd.  
Consulting Engineers and Planners

FEBRUARY, 1973







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**LETTER OF TRANSMITTAL**

**March 5, 1973  
File: 973-2-0-1**

Mr. R.N. Briggs, Director,  
Pollution Control Division,  
Department of the Environment,  
Government of Alberta,  
Milner Building  
10040 - 104th Street,  
EDMONTON 14, Alberta

Dear Mr. Briggs:

In accordance with the Agreement between the Government of Alberta and Stanley Associates Engineering Ltd., we have completed a Survey and Assessment of Atmospheric Odor in the Edmonton Area. We are pleased to submit this final report detailing the results of the Study.

Under separate cover, we will be sending you the raw data collected during the Study, a listing of the computer program written to analyze the data, and printouts of the output information generated by the computer runs.

We appreciate having been given the opportunity to serve you, and are available at your convenience for discussion and clarification.

Respectfully submitted,  
**Stanley Associates Engineering Ltd.**

R.D. Kennedy, P. Eng.  
Project Manager

D.R. Stanley, S.D., P. Eng.  
President

RDK:las



## **ACKNOWLEDGMENT**

We wish to thank the Alberta Department of the Environment for their assistance throughout this Study. We also appreciate the efforts of the Edmonton and St. Albert Fire Departments, and the Sherwood Park R.C.M.P. who made continuous observations of odor conditions in the Edmonton Area. Finally, we are indebted to the many concerned residents of Edmonton, Sherwood Park and St. Albert who participated in the odor occurrence surveys, and who contributed much valuable information to the telephone complaint service.





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## SYNOPSIS

A Study has been completed for the Alberta Department of the Environment with the purpose of surveying and assessing the occurrence of odor in the air in the Edmonton area.

The Study was conducted throughout 1972 and consisted of four distinct aspects:

- a) A public opinion survey was made to obtain the opinion reaction of Edmonton area residents to odor pollution.
- b) Daily observation of odor occurrences were taken during the year by members of the fire departments and R.C.M.P. in the area.
- c) Two surveys were conducted among Metropolitan Edmonton residents (one in Summer and one in Winter), in which individuals selected at random made observations concerning the occurrence of odors at their residences.
- d) A telephone answering service was established to receive and compile complaints of odor occurrences on a 24 hour basis.

Automotive exhaust is the most common and widespread contributor to noticeable odor in the Edmonton area. However, the perceived strength of exhaust odors is not intense, nor are they considered to be extremely offensive to most residents. Chemical, meat processing and sewage odors rank next in order of frequency. In contrast to exhaust fumes, these odors are usually stronger and more offensive, and in some instances have a very disturbing affect on residents.

The southeast section of Edmonton generally has the worst overall odor pollution problem in the Metropolitan area. Northeast Edmonton ranks a close second. Both areas experience frequent odor occurrences, and are particularly affected by the chemical and meat processing odors. Sherwood Park seems to experience a slightly lower incidence of odor occurrence, most of it being due to the nearby petroleum and chemical industry. West Edmonton and St. Albert are much less affected by bad odors, with most of these residents feeling they do not have a serious odor problem.

The major sources of odor most commonly identified by Edmonton residents (excluding motor vehicles) are: the meat packing and rendering plants, the east-end chemical plants, refineries, and sewage treatment facilities.

Weather, season and wind direction all influence the observation of odors. Hot weather accompanied by low wind velocity greatly increased the observations of odor, particularly from meat processing and sewage sources. There was a noticeable increase in the frequency of chemical and petroleum odor complaints during periods of temperature inversion and high air quality index. In general, Summer produces a greater awareness of odors than any other season, and an increase in the observation of odor occurrences. Odors in Southeast and Northeast Edmonton are observed most often when the winds are from a southerly or easterly direction. Although easterly winds do not prevail in Edmonton, they are frequently associated with temperature inversions which intensify the effect of odorous emissions on these areas. Sherwood Park is most affected by northwesterly to westerly winds.

In summary, the results of this Study show that the Edmonton area has a significant level of odor occurrences which at times is sufficiently objectionable to disturb many people. Although odor pollution is not considered to be an extremely serious problem in Edmonton, there is a definite concern and awareness of the problem to the extent that most residents feel that stronger measures should be taken to control pollution.

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## **SECTION 1**

### **INTRODUCTION**

#### **PURPOSE OF THE STUDY**

Early in 1972, a Study was commissioned by the Alberta Department of the Environment to "survey and assess the occurrence of odor in the air in the Edmonton area".

The purpose of the Study was to:

1. Evaluate the frequency, amplitude and nature of noticeable odors in the City of Edmonton.
2. To obtain the "opinion" reaction by residents of the City to the odors, or absence of odors, in the various parts of the City.
3. To make observations to determine the premises, or the location from which odorous materials are being released which are causing noticeable odors in any part of the City, and noting the approximate area of the City in which that odor is noticeable.

The scope of the Study also includes an analysis of alternative legislative approaches for reducing odors and their adverse effects on the Edmonton area.

Data collection began in February, 1972 and continued through December 31, 1972, so as to provide data over a wide range of weather and seasonal conditions.

#### **METHODS OF DATA COLLECTION**

Several data collection methods were used to obtain information concerning the occurrence of odor and the impact of odors on the residents of Edmonton.

##### **1. Public Opinion Survey**

A Public Opinion Survey was conducted in February and March, 1972 by The Regional Marketing Surveys Ltd. and consisted of direct home interviews. In order to prevent the formulation of biased opinion, this survey was made before any

publicity had been given to the Odor Study. The objective of the interviews was to determine the level of concern for odor pollution, the meaning of odor pollution, the area where odors are considered to be most serious, the sources considered most responsible for bad odors in the Edmonton area, conditions under which residents consider odor to be worse, and the extent to which odors bother people.

## **2. Fire Halls and R.C.M.P. Survey**

The services of the Edmonton and St. Albert Fire Halls and of the Sherwood Park R.C.M.P. Station were used to obtain a continuous record of odor occurrences throughout the period of the Study. Observations were taken once per shift on a 24 hour basis. The value of this information was to provide an extended period of observation with which to relate to variations in the frequency of odor occurrences in the other surveys.

## **3. Household Odor Occurrence Surveys**

Two household surveys were conducted, one in Summer and one in Winter. The method used was to select several residents at random from each area of the City, and have them make daily observations of odor occurrences at their home for a 2 week period. The same sample was used in both the Summer and Winter surveys so as to obtain consistent controlled data that would provide information regarding the effect of season and weather on odor occurrence. Appendix B-1 provides a sample of the form used by the fire halls and households to record their observations.

The objective of the household surveys was to collect information concerning the occurrence of all types of odors, and eliminate the bias of telephone complaints which tend to elicit the highly objectionable odors. One aspect of these surveys was to determine if there were significant differences in the results obtained from undisciplined volunteers as opposed to the disciplined police and firemen.

## **4. Telephone Complaint Service**

A telephone answering service was established to receive and compile complaints on a 24 hour basis using a recording telephone. Complaints were received from late March 1972 until December 31, 1972. Participation in this program was encouraged by means of periodic advertising in the Edmonton Journal, combined with an initial press conference and a follow-up radio interview in October. The object of the telephone service was to obtain comments and complaints of odor occurrences from all segments of the total population in the Edmonton Area. Appendix B-2 provides a copy of the advertisement, and Appendix B-3 is a sample of the form used to collect the complaint data.

# DESIGNATION OF AREAS REFERENCED IN ODOR ANALYSIS

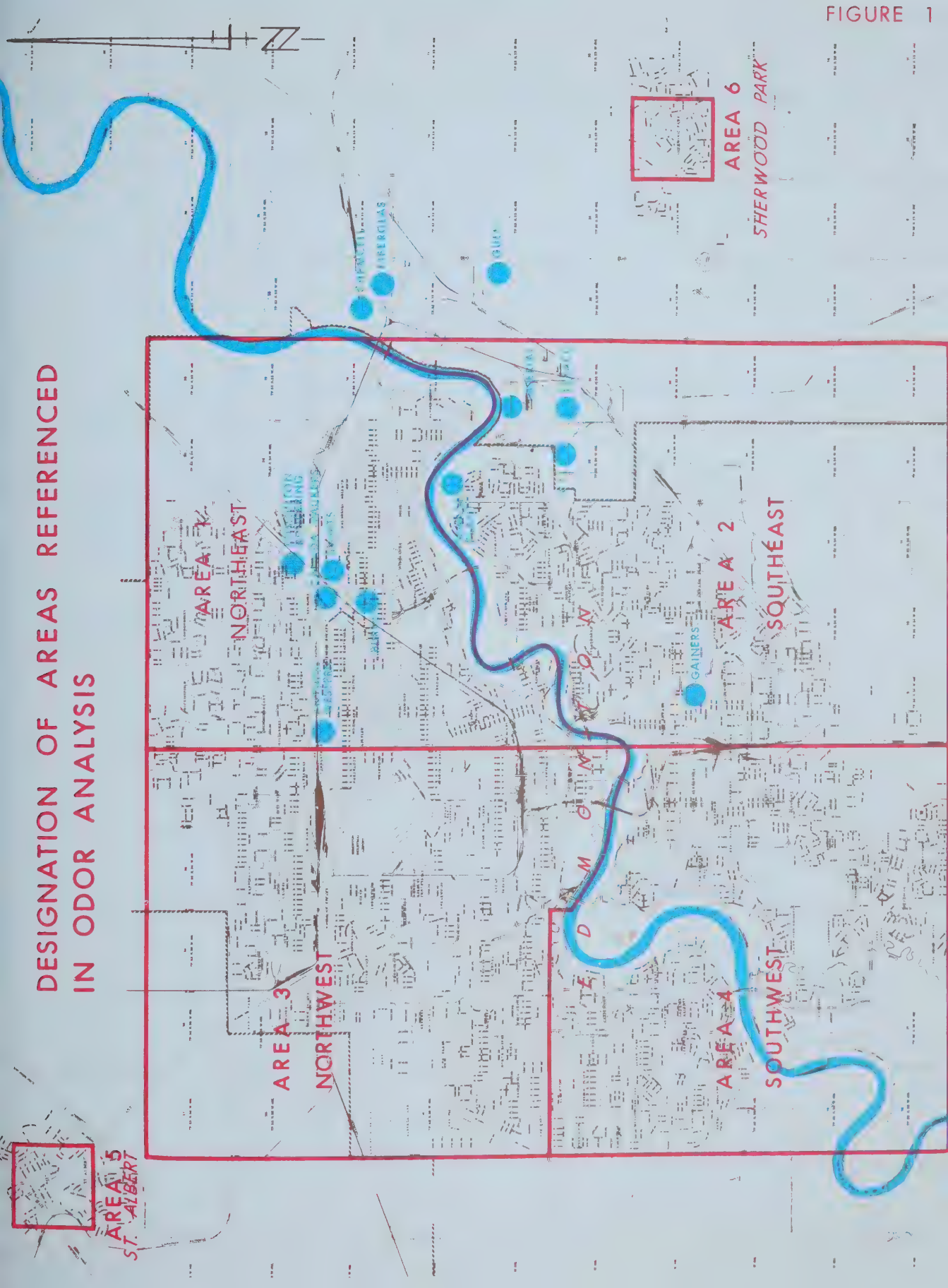


FIGURE 1





Identical information was solicited from each of the odor surveys (except for the Public Opinion Survey):

Name and Address  
Location of Odor  
Date and Time of Day  
Type of Odor  
Strength of Odor  
Suspected Source  
Wind Direction

This consistency of information enabled comparisons between the results of each survey.

The data was analyzed with the aid of a computer program that was written to collate and sort the information, to calculate totals and ratios, and to print results. The program was written in a fairly generalized manner so that it could be readily modified for use in subsequent odor surveys in Edmonton, or in other parts of Alberta.

For purpose of analysis of odor data, Metropolitan Edmonton was subdivided into the following six general areas as shown on Figure 1:

Northeast Edmonton  
Southeast Edmonton  
Northwest Edmonton  
Southwest Edmonton  
St. Albert  
Sherwood Park

The City of Edmonton proper was further broken down into 100 grid areas, each representing one square mile of the City. Odor occurrence data and telephone complaints were accumulated for these grid areas to determine more specific locations of high odor problems.

It must be noted that the identification of odor sources are the expressions of opinion and observation by the residents who contributed information to the Study, and not the results of physical measurement.

## SECTION 2

### SUMMARY OF RESULTS FROM THE EDMONTON ODOR STUDY

#### OVERALL CONCLUSIONS

The three odor occurrence surveys each provided useful information which tended to confirm the opinions expressed by the residents of Edmonton in the Public Opinion Survey.

The general conclusions that can be derived from the Edmonton Odor Study are:

1. Southeast Edmonton appears to have the worst overall odor pollution problem in the Edmonton area, with Northeast Edmonton ranking a close second. Sherwood Park seems to have a slightly lower incidence of odor occurrence, although on a per capita basis the level of complaints is high.
2. Automotive exhaust fumes are the most common and widespread contributor to odor pollution in Edmonton, but the perceived strength of these odors is not intense, nor are exhaust odors considered to be extremely offensive.
3. Chemical, meat processing, and sewage odors rank next in observed frequency. In contrast to exhaust fumes, these odors tend to be much stronger, and have a more disturbing effect on residents.
4. The major sources of odor in Edmonton are motor vehicles, meat packing plants, the rendering plant, east-end chemical plants (especially C.I.L., Chemcell, Fiberglas), the refineries, and sewage treatment facilities.
5. Season, weather, and wind direction all influence the observation of odors in terms of frequency, type of odor observed, and area affected.

#### COMPARISON OF RESULTS FROM EACH SURVEY

##### A. Public Opinion Survey

A total of 534 interviews were conducted in a Public Opinion Survey. The Edmonton area was divided into 5 districts (this survey combined Northwest and Southwest Edmonton into one district). A minimum of 100 interviews were made in each district to provide sufficient sample sizes in each district for valid comparative analysis. This procedure results in a disproportionate stratified sample with the small

districts over-represented in the total. To provide accurate results of the total Edmonton area, the data from each district was weighted according to the relative district populations.

The Public Opinion Survey has been reported in detail to the Department of the Environment, but the results are summarized below:

1. Residents of the Edmonton area are concerned about air pollution, although it ranks behind drug abuse, cost of housing, and unemployment in terms of seriousness. In the east half of Edmonton and in Sherwood Park, air pollution is rated as being a very serious problem. In West Edmonton and St. Albert, it is rated as being fairly serious.
2. In general, the people of Edmonton feel that the most serious aspect of air pollution is bad odor in the air.
3. According to the residents, there are 4 major contributors to odor pollution in the Edmonton area. The worst offenders are the refineries followed by meat packing plants, Chemcell, and automotive exhaust.
4.
  - a) Overall, the residents of Southeast Edmonton appear to have the worst odor pollution problems. The odors mentioned most frequently are from the refineries, followed by C.I.L., Chemcell, and the meat packing plant.
  - b) Northeast Edmonton also has a high level of concern for bad odors, and the proportion of residents describing bothersome odors is almost as high as in Southeast Edmonton. However, the overall odor problem appears to be less severe in Northeast Edmonton. The major sources of bad odor stated by these residents are the meat processing plants, followed by Chemcell and the refineries.
  - c) The level of concern with bad odor in Sherwood Park is greater than in the west side of Edmonton, but less than in the other east-side areas. The major sources of bad odors here are the refineries, with the chemical plants as distant runners-up.
  - d) Residents of West Edmonton and St. Albert generally feel that they do not have serious odor problems. Automotive exhaust is listed as the major source of odor in West Edmonton, while the source which does bother some St. Albert residents is the sewage lagoon.



5. Wind direction, season and time of day influence the seriousness of bad odors. Odors in Southeast and Northeast Edmonton appear worse when the wind is from the east, whereas Sherwood Park is most affected by wind from the northwest, north or west. Odors are more pronounced in Summer and in the evening.
6. The concern with air pollution decreases with age, increases with higher income, and is greater among women than men.
7. About 6% of the population claim that odors in their neighborhood bother them enough so that it sometimes affects what they are going to do. However, 58% say that odors in their neighborhood do not bother them.
8. 59% of the residents feel that stricter laws and regulations should be passed and enforced against companies which cause air pollution.

#### **B. Fire Hall and R.C.M.P. Survey**

This survey involved having routine odor observations taken on a 24 hour basis from a disciplined population at 8 fire halls in Edmonton, 1 fire hall in St. Albert, and at the R.C.M.P. Station in Sherwood Park. Three observations were taken each day at the start of each shift, and the occurrence or absence of odor was noted.

Because there were only 10 stations monitoring odor occurrences in the 6 areas of Edmonton, it is not possible to make valid comparisons from this survey concerning the degree of odor pollution between areas. However, useful information did come from the results, and some interesting differences were noted between these results and those obtained from the other odor occurrence surveys. In order to make the results representative of the total Edmonton area, the data for each area was weighted by the respective population. The results of the Fire Hall Survey are summarized below:

1. Automotive exhaust fumes are the major type of bad odor observed by the Fire Halls and R.C.M.P. Station, contributing to 31% of all odors noted. This was followed by chemical odors, meat processing odors, and wood smoke.
2. The average strength of these odors was perceived as not being very strong. Exhaust fumes and miscellaneous odors were usually described as "barely noticeable", while odors of the chemical, sewage, and meat processing type were generally "quite noticeable".

3. Odors were noted on only 6% of all observations. The frequency of odor occurrences observed by the volunteer group during the Household Survey was more than double the frequency of observations noted by the disciplined firemen and the police during the same periods.
4. Sewage odors, which constituted a large percentage of the total occurrences, were not significantly large in the results weighted by population because most of the sewage odors were noted in St. Albert. The St. Albert Fire Hall is located close to the sewage lift station which was the source of these odors.
5. The Fire Hall Survey showed a high percentage of miscellaneous “unknown” odors that were not identified. 16% of all odors observed by the Firemen were classified as unknown as compared with a very low percentage of unknown odors in both the Household Survey and the Telephone Complaint Survey.
6. The number of odor sources identified by the fire halls was also very low (only 13%), and 80% of the sources that were identified came from one fire station. By comparison, 76% of telephone complaints identified the source, as did 20% of the Household Survey occurrences.
7. Chemical odors were widely observed, but most predominately in the Northeast, Southeast, and Sherwood Park. This concurs with the results of all other surveys. Also, as expected, the Northeast observed a large number of meat processing odors. However, Southeast Edmonton did not record any meat processing odors, probably because the only fire hall in that area was 2 miles from the major source (Gainers), which appears to be outside the range of this type of odor.

### **C. Household Occurrence Surveys**

Two separate surveys were conducted by randomly selecting households and asking them to volunteer to observe odor conditions at their residence. In order to ensure that each area of Edmonton had a sufficiently large number of households represented in the survey, the sample sizes in each area were made disproportionate to their respective population. The results were weighted according to population to provide total Edmonton results.

Two periods were selected (late July/early August, and late November/early December) in order to obtain a comparison between Winter and Summer conditions. The same households were asked to participate in both surveys so as to provide a consistent type of response in each period. About 40% of the people selected at random agreed to participate in the Summer survey. Only two-thirds of these also volunteered

for the Winter survey. The number of households in each area ranged from 17 to 33 in Summer, and from 10 to 23 in Winter. Observations were made three times a day (or whenever a noticeable odor change took place) over a period of two weeks. The results are summarized below:

1. Odors were noted on 13% of all observations made in the Summer survey, and 9% of the time in the Winter survey. In the Summer survey, the highest odor frequency was observed in Northeast Edmonton (18% of Summer observations recorded a noticeable odor). Southeast Edmonton observed the second highest frequency of odor occurrences in Summer. These two areas also recorded the highest frequencies in the Winter survey, although the Southeast area exceeded the Northeast.
2. Surprisingly, the frequency of odor observations in Sherwood Park was well below average in both house surveys, ranking 4th in Winter and 5th in Summer.
3. St. Albert registered high odor occurrence during the Summer survey (ranking 3rd), and was as odorous as Sherwood Park overall. This is in marked contrast to the Public Opinion Survey and the results of the telephone complaints, both of which indicated that St. Albert is relatively low in bothersome odors. It appears that one zealous person in St. Albert, who participated only in the Summer survey, may have significantly influenced the result. Without this one household, St. Albert would have ranked 5th in both surveys.
4. In the total Edmonton area, the most common type of odor recorded in both surveys was automotive exhaust. In the Summer survey, this was followed closely by chemical odors, then by meat processing and wood smoke. In Winter, the odor was somewhat reversed with wood smoke ranking 2nd, followed by chemical and meat processing odors.
5. The type of odors observed varied considerably between areas. Chemical odors were dominant in the Northeast, Southeast, and Sherwood Park, but also occurred to some degree in all areas. Meat processing odors were restricted primarily to Northeast and Southeast Edmonton where the packing plants are located. Although exhaust fumes and wood smoke were widely observed in all areas, they were more evident in the west side than in eastern Edmonton where other odors are more prominent.
6. Very few odor occurrences were listed as an unknown type. More than 98% of all odors were identified as to type.

7. The source of the odor was identified on only 20% of all odor occurrences. While this exceeds the fire hall experience, it is well below the response obtained from the Telephone Complaint Survey. The sources most often identified were with C.I.L., Chemcell, refineries, Gainers, the Northeast packing plants, and Building Products.
8. Comparison of the Summer survey versus the Winter survey shows some interesting differences:
  - a) The frequency of odor occurrence was much higher in the Summer survey in all areas. Although each survey covered only 3 weeks of the season, this observation was confirmed by the Telephone Complaint Survey, the Fire Hall Survey, and the Public Opinion Survey.
  - b) The average strength of odor occurrences was greater in the Summer survey, with the average Summer strength perceived as "quite noticeable" compared to Winter where the average strength was between "barely noticeable" and "quite noticeable". In particular, meat processing odors were "very strong" in the Summer survey.
  - c) Although exhaust fumes were the largest type of odor observed in both surveys, almost half of all Winter occurrences were exhaust fumes compared with only one-quarter of Summer odors. However, the relative frequency of exhaust fume odors was not significantly different between seasons. The major difference between Summer and Winter was the large decline in meat processing and chemical odors in the Winter survey.

#### **D. Telephone Complaint Survey**

A continuous 24-hour telephone answering service was established to record complaints from residents who had observed odors in the Edmonton area. A total of 542 complaints were recorded between March 27 and December 31, 1972, of which 522 were valid complaints with sufficient information to permit analysis. Appendix A provides a computer list of all the valid telephone complaints by grid area. Appendix B-4 lists the meaning of the numerical codes appearing in the computer printout.

The results of the Telephone Complaint Survey are summarized below:

1. The largest number of odor complaints involved meat processing and chemical odors. These two types of odors accounted for one-half of all the complaints. The other major type of odor complaint was sewage (primarily from sewers and sewage treatment facilities). Only 2% of all telephone complaints arose from exhaust fumes, and there were no complaints about wood smoke.



2. The average strength of odor was much higher than for any of the other surveys. In general, the strength of odors was described as being between "quite noticeable" to "very noticeable", with many complaints recorded as "extremely strong".
3.
  - a) The residents of Southeast Edmonton registered the largest number of complaints (38% of all complaints), and the highest number of complaints per capita. Over half of these complaints were for chemical and meat processing odors, with sewage being the only other major odor.
  - b) Northeast Edmonton received the next largest number of complaints, having 33% of the total. Nearly half of these complaints were for meat processing odors. Chemical and sewage odors were the other significant types.
  - c) Although Sherwood Park registered only 6% of all complaints, it was second to Southeast Edmonton in the number of complaints per capita. Most of these complaints were of a chemical or rotten egg type of odor.
  - d) Northwest and Southwest Edmonton registered one-third the number of complaints of the two East Edmonton areas. There was little difference in the number, strength, or type of complaints in the two West Edmonton areas. Both complained about odors from sewers, and each had a high degree of miscellaneous type odors.
  - e) St. Albert had only three complaints. Although the population is not large, this was the lowest response per capita.
4. A large number of telephone complaints identified the source of odor. Most of the sources were in three categories: petroleum/chemical plants, meat processing, and sewage.

Petroleum/chemical sources were often identified in fairly general terms, such as refinery, chemical plant, or chemical row. In some cases, two or more specific plants were named as possible sources. However, Fiberglas, Chemcell, and C.I.L. received specific mention on numerous complaints.

Meat processing sources were more specific. In the Southeast, all but one resident specifically named Gainers. In the Northeast, the major sources were the rendering plant, and the packing plants in general.

The Hardisty Sewage Plant received a large number of complaints as being the source of sewage odors, as did sewers in general.

5. More complaints were recorded in the Summer than in the Winter. Meat processing odors especially had a higher frequency in Summer. This accounted for the significant decline in complaints during the Winter in Northeast Edmonton, where meat processing forms a large percentage of the total odors.
6. The influence of wind direction depends on the area and type of odor. Southeast Edmonton is most often affected by chemical odors when the wind is from an easterly or southeasterly direction, and by meat processing odors when the wind is southerly. In contrast, Northeast Edmonton observes chemical odors when the wind is southerly, and meat processing odors from a southwesterly wind. Sherwood Park is most generally affected by winds from the northwest quadrant.
7. Hot weather accompanied by light winds greatly increased the number of complaints from meat processing and sewage sources. There was a noticeable increase in the frequency of odor complaints during periods of high air quality index and temperature inversion.
8. More complaints were made in the late afternoon and evening than at any other time.

## **DIFFERENCES BETWEEN THE VARIOUS SURVEYS**

### **A. Public Opinion Survey**

This survey provided the basis from which to design the other surveys. It is a record of the opinions expressed by the residents of Edmonton, and thus gives useful information into the magnitude of the odor problem as it is perceived by these residents. In general, all the important aspects brought out in the Public Opinion Survey were confirmed and reinforced by the data collected in the other surveys. The opinions of the residents tend to focus on the major type of odors and on the dominant sources (those that are highly evident, and have historically caused much of the City's odor problem).

### **B. Fire Hall Survey**

The response from the fire halls was not as committed or concerned as from the other surveys. Participation dropped off quite noticeably after the first two months, and on the average the stations missed about one-third of the intended observations.

The frequency of odor occurrence was much less than that observed by the Household Survey. Very few odors were identified as to source, and a large percentage were classified as unknown. The response is somewhat biased by the small number of persons involved in the survey, and by the location of the few stations which do not provide a random set of observations over all areas of Edmonton. Nevertheless, the fire hall data is generally consistent with that obtained from other sources, and does provide a continuous record of odor occurrence patterns with which we can compare the results of the other surveys.

#### **C. Household Occurrence Survey**

The household residents were generally quite diligent about providing complete information, and the survey duration was sufficiently short to maintain commitment. Although the participants were chosen randomly within each area, the results may be biased by the fact that the 40% who accepted are presumably more concerned with odor than those who refused. In addition, while the sample within each area was fairly well distributed, some districts were more heavily represented, and there may not have been representative sampling near some major sources of fairly localized odors. Despite these problems, the results generally agree with the other surveys.

With respect to the Summer versus Winter analysis, there is the danger that one or both periods surveyed were not representative of the total season. However, the data from the fire halls and the telephone complaints both confirm the results of the Household Survey that Summer produces greater odor problems than other seasons.

#### **D. Telephone Complaint Survey**

The telephone complaint survey generated wide response throughout the entire period of the Study. However, the type of odor complaint that was generated from the spontaneous telephone response was distinctively different from that of the structured surveys where people were specifically asked to observe odors. Telephone complaints were usually received from extremely concerned or bothered residents. The odors were usually strong ones that often affected the resident physically or emotionally. The vast majority of telephone complaints identified the source, in contrast to the other surveys.

One of the most significant differences was in the exceedingly small number of telephone complaints concerning automotive exhaust, as compared with the large number of exhaust odors observed in the Household Survey and Fire Hall Survey. This is probably due to two factors:

- a) Exhaust fume odors are common, localized, and not perceived as being particularly strong. Whereas they will be noted by people specifically requested to make an observation, they are not sufficiently offensive to prompt a person to telephone.
- b) Fire Hall and Household Survey observations were made generally at the same three times each day. Two of the three common times were 8 a.m. and 4 p.m., which are the periods of maximum traffic.

The telephone complaints sampled virtually the entire population, and thus produced the widest variety of response. It provides a good indication of which odors greatly disturb the residents, and where they have the greatest impact. It provided excellent data on the source of odors, and the distance from the source that the odors are commonly detected.



## SECTION 3

### TYPES OF ODORS IN EDMONTON

Most of the odors observed in the Edmonton area are of five types:

Exhaust Fumes

Chemical Odor

Meat Processing

Sewage

Wood Smoke

Tables 1-a and 1-b list the relative frequency of each type of odor noted in the Telephone Complaint Survey. Tables 2-a, 2-b and 3 give the frequency of odor occurrences by type as recorded in the Household Survey and Fire Hall Survey. Table 4 shows the breakdown of miscellaneous odors recorded in the Household Survey. The meaning of the numeric code used in the tables for the average strength of odor is as follows:

#### Code

|     |                   |
|-----|-------------------|
| 1.0 | No Odor           |
| 2.0 | Barely Noticeable |
| 3.0 | Quite Noticeable  |
| 4.0 | Very Noticeable   |
| 5.0 | Extremely Strong  |

There are considerable differences noted between the types of odors in terms of strength of odor, degree of annoyance, area of Edmonton affected, and season.

TABLE 1-a

**TYPES OF TELEPHONE COMPLAINTS  
IN METROPOLITAN EDMONTON**

|                            | No. of<br>Complaints | * As<br>% of<br>Total | Average<br>Strength<br>of Odor | Telephoned<br>Avg. Wind<br>Direction | Industrial<br>Average<br>Wind<br>Direction | Airport<br>Average<br>Speed<br>mph |
|----------------------------|----------------------|-----------------------|--------------------------------|--------------------------------------|--------------------------------------------|------------------------------------|
| <b>Total Edmonton Area</b> |                      |                       |                                |                                      |                                            |                                    |
| Rotten Eggs                | 35                   | 7                     | 3.2                            | SSW                                  | SSE                                        | 7.6                                |
| Exhaust Fumes              | 8                    | 2                     | 3.3                            | W                                    | W                                          | 7.8                                |
| Tar                        | 2                    | 0                     | 3.0                            | WSW                                  | NNW                                        | 7.5                                |
| Chemical                   | 125                  | 24                    | 3.7                            | SE                                   | SSE                                        | 8.6                                |
| Sewage                     | 81                   | 16                    | 3.5                            | SSW                                  | SSW                                        | 6.7                                |
| Meat Processing            | 136                  | 26                    | 3.6                            | SSW                                  | SSW                                        | 9.3                                |
| Wood Smoke                 | 0                    |                       |                                |                                      |                                            |                                    |
| Plastic                    | 6                    | 1                     | 3.5                            | SE                                   | SE                                         | 9.0                                |
| Burning Garbage            | 11                   | 2                     | 3.1                            | WSW                                  | SW                                         | 8.6                                |
| Other                      | 118                  | 23                    | 3.5                            | SSE                                  | SW                                         | 7.9                                |
| <b>Total Edmonton</b>      | <b>522</b>           | <b>100</b>            |                                |                                      |                                            |                                    |

\*Individual percentages may not total 100% due to rounding.



TABLE 1-b (Cont'd)

## TYPES OF TELEPHONE COMPLAINTS BY AREA

|                    | No. of<br>Complaints | * As<br>% of<br>Total | Average<br>Strength<br>of Odor | Telephoned<br>Avg. Wind<br>Direction | Industrial<br>Average<br>Wind<br>Direction | Airport<br>Average<br>Speed<br>mph |
|--------------------|----------------------|-----------------------|--------------------------------|--------------------------------------|--------------------------------------------|------------------------------------|
| Northwest Edmonton |                      |                       |                                |                                      |                                            |                                    |
| Rotten Eggs        | 2                    | 3                     | 3.0                            | E                                    | ESE                                        | 10.0                               |
| Exhaust Fumes      | 4                    | 7                     | 3.5                            | NNW                                  | WNW                                        | 9.0                                |
| Chemical           | 7                    | 12                    | 3.4                            | ENE                                  | SE                                         | 7.6                                |
| Sewage             | 14                   | 24                    | 3.1                            | WSW                                  | S                                          | 5.1                                |
| Meat Processing    | 3                    | 5                     | 3.3                            |                                      | SW                                         | 6.7                                |
| Burning Garbage    | 5                    | 8                     | 3.0                            | WSW                                  | SSW                                        | 10.8                               |
| Other              | 24                   | 41                    | 3.5                            | SSW                                  | S                                          | 10.5                               |
| Total Northwest    | 59                   | 100                   | 3.4                            |                                      |                                            |                                    |
| Southwest Edmonton |                      |                       |                                |                                      |                                            |                                    |
| Rotten Eggs        | 7                    | 12                    | 3.3                            | SSE                                  | SE                                         | 6.7                                |
| Exhaust Fumes      | 1                    | 2                     | 3.0                            |                                      | SSW                                        | 5.0                                |
| Chemical           | 9                    | 16                    | 3.4                            | E                                    | E                                          | 6.7                                |
| Sewage             | 14                   | 25                    | 3.3                            | E                                    | SW                                         | 8.3                                |
| Meat Processing    | 3                    | 5                     | 3.0                            | SSE                                  | SSE                                        | 9.7                                |
| Plastic            | 1                    | 2                     | 3.0                            | SE                                   | S                                          | 8.0                                |
| Burning Garbage    | 5                    | 9                     | 3.2                            | W                                    | SSW                                        | 4.8                                |
| Other              | 17                   | 30                    | 3.4                            | SSE                                  | SW                                         | 7.2                                |
| Total Southwest    | 57                   | 100                   | 3.3                            |                                      |                                            |                                    |

\*Individual percentages may not total 100% due to rounding.



TABLE 1-b (Cont'd)

## TYPES OF TELEPHONE COMPLAINTS BY AREA

|                     | No. of<br>Complaints | * As<br>% of<br>Total | Average<br>Strength<br>of Odor | Telephoned<br>Avg. Wind<br>Direction | Industrial<br>Average<br>Wind<br>Direction | Airport<br>Average<br>Speed<br>mph |
|---------------------|----------------------|-----------------------|--------------------------------|--------------------------------------|--------------------------------------------|------------------------------------|
| St. Albert          |                      |                       |                                |                                      |                                            |                                    |
| Rotten Eggs         | 1                    | 33                    | 5.0                            |                                      | SSE                                        | 8.0                                |
| Other               | 2                    | 67                    | 3.5                            | S                                    | N                                          | 8.0                                |
| Total St. Albert    | 3                    | 100                   | 4.0                            |                                      |                                            |                                    |
| Sherwood Park       |                      |                       |                                |                                      |                                            |                                    |
| Rotten Eggs         | 6                    | 19                    | 3.5                            | NW                                   | SW                                         | 7.8                                |
| Tar                 | 1                    | 3                     | 3.0                            | NW                                   | WNW                                        | 6.0                                |
| Chemical            | 17                   | 53                    | 3.5                            | W                                    | WSW                                        | 8.8                                |
| Other               | 8                    | 25                    | 3.5                            | W                                    | WSW                                        | 10.4                               |
| Total Sherwood Park | 32                   | 100                   | 3.5                            |                                      |                                            |                                    |

\*Individual percentages may not total 100% due to rounding.

TABLE 2-a

**TYPES OF ODOR OCCURRENCES  
IN METROPOLITAN EDMONTON  
HOUSEHOLD SURVEY**

|                                                            | Summer Survey   |                    |                     | Winter Survey   |                    |                     |
|------------------------------------------------------------|-----------------|--------------------|---------------------|-----------------|--------------------|---------------------|
|                                                            | No. of<br>Odors | * As %<br>of Odors | Average<br>Strength | No. of<br>Odors | * As %<br>of Odors | Average<br>Strength |
| <b>Total Edmonton Area<br/>(Unadjusted for Population)</b> |                 |                    |                     |                 |                    |                     |
| Rotten Eggs                                                | 22              | 3                  | 3.2                 | 12              | 4                  | 2.9                 |
| Exhaust Fumes                                              | 148             | 20                 | 2.4                 | 131             | 40                 | 2.5                 |
| Tar                                                        | 52              | 7                  | 2.8                 | 3               | 1                  | 2.3                 |
| Chemical                                                   | 159             | 22                 | 3.0                 | 56              | 17                 | 2.7                 |
| Sewage                                                     | 38              | 5                  | 2.8                 | 5               | 2                  | 2.6                 |
| Meat Processing                                            | 71              | 10                 | 3.7                 | 20              | 6                  | 2.8                 |
| Wood Smoke                                                 | 91              | 12                 | 2.7                 | 53              | 16                 | 2.7                 |
| Plastic                                                    | 2               | 0                  | 3.0                 | 6               | 2                  | 2.5                 |
| Burning Garbage                                            | 32              | 4                  | 2.8                 | 6               | 2                  | 4.0                 |
| Other                                                      | 119             | 16                 | 2.9                 | 32              | 10                 | 3.1                 |
| <b>Total Edmonton Area</b>                                 | <b>734</b>      | <b>100</b>         | <b>2.9</b>          | <b>324</b>      | <b>100</b>         | <b>2.7</b>          |
| <b>Total Edmonton Area<br/>(Weighted by Population)</b>    |                 |                    |                     |                 |                    |                     |
| Rotten Eggs                                                | 12              | 2                  | 3.0                 | 10              | 3                  | 3.0                 |
| Exhaust Fumes                                              | 168             | 24                 | 2.4                 | 150             | 46                 | 2.5                 |
| Tar                                                        | 53              | 8                  | 2.9                 | 3               | 1                  | 2.3                 |
| Chemical                                                   | 142             | 20                 | 3.0                 | 42              | 13                 | 2.7                 |
| Sewage                                                     | 28              | 4                  | 2.8                 | 7               | 2                  | 2.7                 |
| Meat Processing                                            | 75              | 11                 | 3.7                 | 18              | 6                  | 2.8                 |
| Wood Smoke                                                 | 73              | 11                 | 2.8                 | 56              | 17                 | 2.6                 |
| Plastic                                                    | 0               | 0                  | 3.0                 | 5               | 2                  | 2.5                 |
| Burning Garbage                                            | 33              | 5                  | 2.8                 | 8               | 3                  | 3.6                 |
| Other                                                      | 111             | 16                 | 3.0                 | 28              | 9                  | 3.1                 |
| <b>Total Edmonton Area</b>                                 | <b>695</b>      | <b>100</b>         | <b>2.9</b>          | <b>327</b>      | <b>100</b>         | <b>2.6</b>          |

\*Individual percentages may not total 100% due to rounding.

TABLE 2-b

## TYPES OF ODOR OCCURRENCES BY AREA

## HOUSEHOLD SURVEY

|                    | Summer Survey   |                    |                     | Winter Survey   |                    |                     |
|--------------------|-----------------|--------------------|---------------------|-----------------|--------------------|---------------------|
|                    | No. of<br>Odors | * As %<br>of Odors | Average<br>Strength | No. of<br>Odors | * As %<br>of Odors | Average<br>Strength |
| Northeast Edmonton |                 |                    |                     |                 |                    |                     |
| Rotten Eggs        | 3               | 1                  | 3.0                 | 1               | 1                  | 2.0                 |
| Exhaust Fumes      | 43              | 19                 | 2.4                 | 54              | 65                 | 2.5                 |
| Tar                | 18              | 8                  | 2.8                 | 3               | 4                  | 2.3                 |
| Chemical           | 52              | 23                 | 2.8                 | 1               | 1                  | 3.0                 |
| Sewage             | 7               | 3                  | 3.3                 | 2               | 2                  | 2.0                 |
| Meat Processing    | 48              | 21                 | 3.5                 | 8               | 10                 | 3.1                 |
| Wood Smoke         | 13              | 6                  | 2.3                 | 4               | 5                  | 3.3                 |
| Burning Garbage    | 13              | 6                  | 2.5                 | 0               | 0                  |                     |
| Other              | 31              | 14                 | 3.1                 | 10              | 12                 | 3.3                 |
| Total Northeast    | 228             | 100                | 2.9                 | 83              | 100                | 2.7                 |
| Southeast Edmonton |                 |                    |                     |                 |                    |                     |
| Rotten Eggs        | 3               | 2                  | 3.7                 | 3               | 3                  | 3.7                 |
| Exhaust Fumes      | 33              | 17                 | 2.4                 | 32              | 27                 | 2.2                 |
| Tar                | 16              | 8                  | 2.7                 | 0               | 0                  |                     |
| Chemical           | 61              | 32                 | 3.4                 | 32              | 27                 | 2.7                 |
| Sewage             | 22              | 12                 | 2.6                 | 1               | 1                  | 3.0                 |
| Meat Processing    | 20              | 11                 | 4.2                 | 12              | 10                 | 2.6                 |
| Wood Smoke         | 16              | 8                  | 2.4                 | 20              | 17                 | 2.6                 |
| Plastic            | 0               | 0                  |                     | 6               | 5                  | 2.5                 |
| Burning Garbage    | 2               | 1                  | 3.0                 | 3               | 3                  | 5.0                 |
| Other              | 17              | 9                  | 3.0                 | 10              | 8                  | 2.5                 |
| Total Southeast    | 190             | 100                | 3.0                 | 119             | 100                | 2.6                 |

\*Individual percentages may not total 100% due to rounding.

TABLE 2-b (Cont'd)

## TYPES OF ODOR OCCURRENCES BY AREA

## HOUSEHOLD SURVEY

|                    | Summer Survey   |                    |                     | Winter Survey   |                    |                     |
|--------------------|-----------------|--------------------|---------------------|-----------------|--------------------|---------------------|
|                    | No. of<br>Odors | * As %<br>of Odors | Average<br>Strength | No. of<br>Odors | * As %<br>of Odors | Average<br>Strength |
| Northwest Edmonton |                 |                    |                     |                 |                    |                     |
| Rotten Eggs        | 1               | 1                  | 2.0                 | 3               | 6                  | 3.0                 |
| Exhaust Fumes      | 36              | 46                 | 2.5                 | 27              | 57                 | 2.6                 |
| Tar                | 3               | 4                  | 2.7                 | 0               | 0                  |                     |
| Chemical           | 8               | 10                 | 2.6                 | 4               | 9                  | 2.3                 |
| Sewage             | 0               | 0                  |                     | 2               | 4                  | 3.0                 |
| Meat Processing    | 1               | 1                  | 5.0                 | 0               | 0                  |                     |
| Wood Smoke         | 10              | 13                 | 2.7                 | 7               | 15                 | 3.3                 |
| Burning Garbage    | 4               | 5                  | 3.5                 | 2               | 4                  | 3.5                 |
| Other              | 16              | 20                 | 3.3                 | 2               | 4                  | 3.5                 |
| Total Northwest    | 79              | 100                | 2.8                 | 47              | 100                | 2.8                 |
| Southwest Edmonton |                 |                    |                     |                 |                    |                     |
| Rotten Eggs        | 1               | 2                  | 3.0                 | 0               | 0                  |                     |
| Exhaust Fumes      | 10              | 21                 | 2.3                 | 7               | 33                 | 2.4                 |
| Tar                | 6               | 13                 | 3.3                 | 0               | 0                  |                     |
| Chemical           | 4               | 9                  | 2.8                 | 1               | 5                  | 5.0                 |
| Meat Processing    | 1               | 2                  | 4.0                 | 0               | 0                  |                     |
| Wood Smoke         | 9               | 19                 | 3.4                 | 10              | 48                 | 2.0                 |
| Burning Garbage    | 4               | 9                  | 2.5                 | 1               | 5                  | 2.0                 |
| Other              | 12              | 26                 | 2.6                 | 2               | 10                 | 3.0                 |
| Total Southwest    | 47              | 100                | 2.8                 | 21              | 100                | 2.4                 |

\*Individual percentages may not total 100% due to rounding.



TABLE 2-b (Cont'd)

## TYPES OF OCCURRENCES BY AREA

## HOUSEHOLD SURVEY

|                     | Summer Survey   |                    |                     | Winter Survey   |                    |                     |
|---------------------|-----------------|--------------------|---------------------|-----------------|--------------------|---------------------|
|                     | No. of<br>Odors | * As %<br>of Odors | Average<br>Strength | No. of<br>Odors | * As %<br>of Odors | Average<br>Strength |
| St. Albert          |                 |                    |                     |                 |                    |                     |
| Rotten Eggs         | 11              | 10                 | 3.4                 | 2               | 8                  | 3.0                 |
| Exhaust Fumes       | 20              | 18                 | 2.4                 | 6               | 23                 | 2.8                 |
| Tar                 | 7               | 6                  | 2.9                 | 0               | 0                  |                     |
| Chemical            | 6               | 5                  | 3.7                 | 0               | 0                  |                     |
| Sewage              | 9               | 8                  | 2.9                 | 0               | 0                  |                     |
| Meat Processing     | 1               | 1                  | 2.0                 | 0               | 0                  |                     |
| Wood Smoke          | 24              | 22                 | 2.5                 | 10              | 39                 | 3.0                 |
| Plastic             | 1               | 1                  | 3.0                 | 0               | 0                  |                     |
| Burning Garbage     | 7               | 6                  | 3.1                 | 0               | 0                  |                     |
| Other               | 25              | 23                 | 2.8                 | 8               | 31                 | 3.5                 |
| Total St. Albert    | 111             | 100                | 2.8                 | 26              | 100                | 3.1                 |
| Sherwood Park       |                 |                    |                     |                 |                    |                     |
| Rotten Eggs         | 3               | 4                  | 2.7                 | 3               | 11                 | 2.3                 |
| Exhaust Fumes       | 6               | 8                  | 2.2                 | 5               | 18                 | 3.0                 |
| Tar                 | 2               | 3                  | 2.5                 | 0               | 0                  |                     |
| Chemical            | 28              | 35                 | 2.5                 | 18              | 64                 | 2.7                 |
| Wood Smoke          | 19              | 24                 | 3.1                 | 2               | 7                  | 2.0                 |
| Plastic             | 1               | 1                  | 3.0                 | 0               | 0                  |                     |
| Burning Garbage     | 2               | 3                  | 2.5                 | 0               | 0                  |                     |
| Other               | 18              | 23                 | 2.8                 | 0               | 0                  |                     |
| Total Sherwood Park | 79              | 100                | 2.7                 | 28              | 100                | 2.6                 |

\*Individual percentages may not total 100% due to rounding.

**TABLE 3**  
**TYPES OF ODOR OCCURRENCES**  
**IN METROPOLITAN EDMONTON**  
**FIRE HALL SURVEY**

|                                                            | No. of Odor<br>Occurrences | * As %<br>of Odor | Average<br>Strength |
|------------------------------------------------------------|----------------------------|-------------------|---------------------|
| <b>Total Edmonton Area<br/>(Unadjusted for Population)</b> |                            |                   |                     |
| Rotten Eggs                                                | 16                         | 5                 | 2.7                 |
| Exhaust Fumes                                              | 87                         | 27                | 2.4                 |
| Tar                                                        | 5                          | 2                 | 2.6                 |
| Chemical                                                   | 35                         | 11                | 2.9                 |
| Sewage                                                     | 35                         | 11                | 2.9                 |
| Meat Processing                                            | 20                         | 6                 | 3.2                 |
| Wood Smoke                                                 | 32                         | 10                | 2.7                 |
| Plastic                                                    | 6                          | 2                 | 3.0                 |
| Burning Garbage                                            | 24                         | 7                 | 3.0                 |
| Other                                                      | 65                         | 20                | 2.5                 |
| <b>Total Edmonton</b>                                      | <b>325</b>                 | <b>100</b>        | <b>2.7</b>          |
| <b>Total Edmonton Area<br/>(Weighted by Population)</b>    |                            |                   |                     |
| Rotten Eggs                                                | 18                         | 7                 | 2.9                 |
| Exhaust Fumes                                              | 80                         | 31                | 2.4                 |
| Tar                                                        | 4                          | 2                 | 2.7                 |
| Chemical                                                   | 31                         | 12                | 3.1                 |
| Sewage                                                     | 9                          | 4                 | 2.9                 |
| Meat Processing                                            | 24                         | 9                 | 3.2                 |
| Wood Smoke                                                 | 22                         | 8                 | 2.8                 |
| Plastic                                                    | 4                          | 1                 | 3.2                 |
| Burning Garbage                                            | 10                         | 4                 | 2.9                 |
| Other                                                      | 58                         | 22                | 2.5                 |
| <b>Total Edmonton</b>                                      | <b>260</b>                 | <b>100</b>        | <b>2.7</b>          |

\*Individual Percentages may not total 100% due to rounding.

**TABLE 4**  
**MISCELLANEOUS TYPES OF ODOR OCCURRENCES**  
**HOUSEHOLD SURVEY**

|                | Number of Occurrences of Each Type |           |
|----------------|------------------------------------|-----------|
|                | Summer                             | Winter    |
| Unknown        | 19                                 | 0         |
| Skunky         | 13                                 | 0         |
| Animals        | 12                                 | 0         |
| Smoke          | 11                                 | 13        |
| Barbeque       | 10                                 | 0         |
| Weed Killer    | 8                                  | 0         |
| Rotting Grass  | 8                                  | 0         |
| Burning Rubber | 7                                  | 0         |
| Gas            | 5                                  | 0         |
| Oil            | 5                                  | 0         |
| Manure         | 5                                  | 0         |
| Burning Grass  | 3                                  | 0         |
| Cattle         | 3                                  | 0         |
| Burning Coal   | 0                                  | 6         |
| Burning Paper  | 1                                  | 4         |
| Cooking        | 1                                  | 3         |
| Others         | 8                                  | 6         |
| <b>Total</b>   | <b>119</b>                         | <b>32</b> |

## EXHAUST FUMES

Exhaust fumes are widely observed in all Edmonton areas. Although they are the most frequent type of odor noted in the Household and Fire Hall Surveys, they are not usually perceived as being very strong or offensive odors. For this reason, exhaust fumes seldom prompted telephone complaints (unlike the stronger odors). The frequency of exhaust fume odors was greater in Winter than Summer, and were more frequently observed in the north half of the City than elsewhere.

## CHEMICAL ODORS

Chemical odors were the second most commonly noted type of odor. While these odors are frequently observed in all areas, they are more pronounced in Southeast and Northeast Edmonton, and they are the dominant odor in Sherwood Park. Chemical odors are often observed to be quite strong and greatly disturb many people, which accounts for the large number of telephone complaints received about them. They were described in such terms as "really horrible", "so strong we could hardly stand it", and "gives a choking sensation".

There is a tendency for people to be vague in their description of odors from the refineries, chemical plants and heavy industry. Thus, it is likely that some chemical odors were described as "rotten eggs", "plastic", or "other". Conversely, some odors that were described as "chemical" are likely associated with sources unrelated to the chemical industry, because there is a tendency to blame unusual or foreign odors as being chemical odors from industrial sources.

## MEAT PROCESSING

Meat processing odors are concentrated in two areas, Northeast and Southeast Edmonton. In the vicinity of the meat processing plants, this is the dominant odor. It is usually described in strong terms, and is often considered to be extremely nauseating to the point of seriously affecting the activities of some residents. As a result, there were more telephone complaints concerning meat processing odors than for any other type. Typical of the extremely strong comments made about meat processing odors were: "stinks so bad you can't go outside", "nauseating", "unbearable", and "for God's sake please do something".

Meat processing odors appear to be seasonal. The frequency of occurrence was much greater in Summer than in Winter. Also, they do not seem to travel as far as chemical odors. Most occurrences of these odors were observed close to the meat processing plants. Very few complaints came from more than 1 mile away from the source.

## SEWAGE

There were two main types of sewage odors; those from sewage treatment plants, and those from sanitary sewers. Sewage treatment odors were observed generally close to their source and in the three sections of Edmonton where sewage lagoons are located. They were usually very strong and objectionable odors, and were more commonly observed in Summer than in Winter. Sanitary sewer odors were widely observed in all areas of the City, and were usually localized, isolated occurrences.

Sewage odors elicited many strong comments such as "quite nauseous", "unbearable", and "overpowering".

## WOOD SMOKE

Wood smoke was commonly observed in the Household Survey, especially in Winter when wood-burning fireplaces are in use. These odors were not concentrated in any area, and were not particularly strong. Wood smoke, though common, is probably the least objectionable of all Edmonton odors as evidenced by the fact that not one telephone caller complained about this type of odor. The sources of wood smoke were usually identified as fireplaces or burning at construction sites.



## SECTION 4

### ANALYSIS OF ODOR OCCURRENCES BY AREA

#### GENERAL

The data obtained from the Telephone Complaint Survey and the Household Survey were accumulated into the six general areas of Edmonton and analyzed. Table 5 lists the number of telephone complaints by area.

**TABLE 5**  
**NUMBER OF TELEPHONE COMPLAINTS BY AREA**

|                    | Number of<br>Complaints | Total | % of<br>Population |
|--------------------|-------------------------|-------|--------------------|
| Northeast Edmonton | 171                     | 33    | 25                 |
| Southeast Edmonton | 200                     | 38    | 20                 |
| Northwest Edmonton | 59                      | 11    | 27                 |
| Southwest Edmonton | 57                      | 11    | 22                 |
| St. Albert         | 3                       | 1     | 2                  |
| Sherwood Park      | 32                      | 6     | 4                  |
| Total              | 522                     | 100   | 100                |

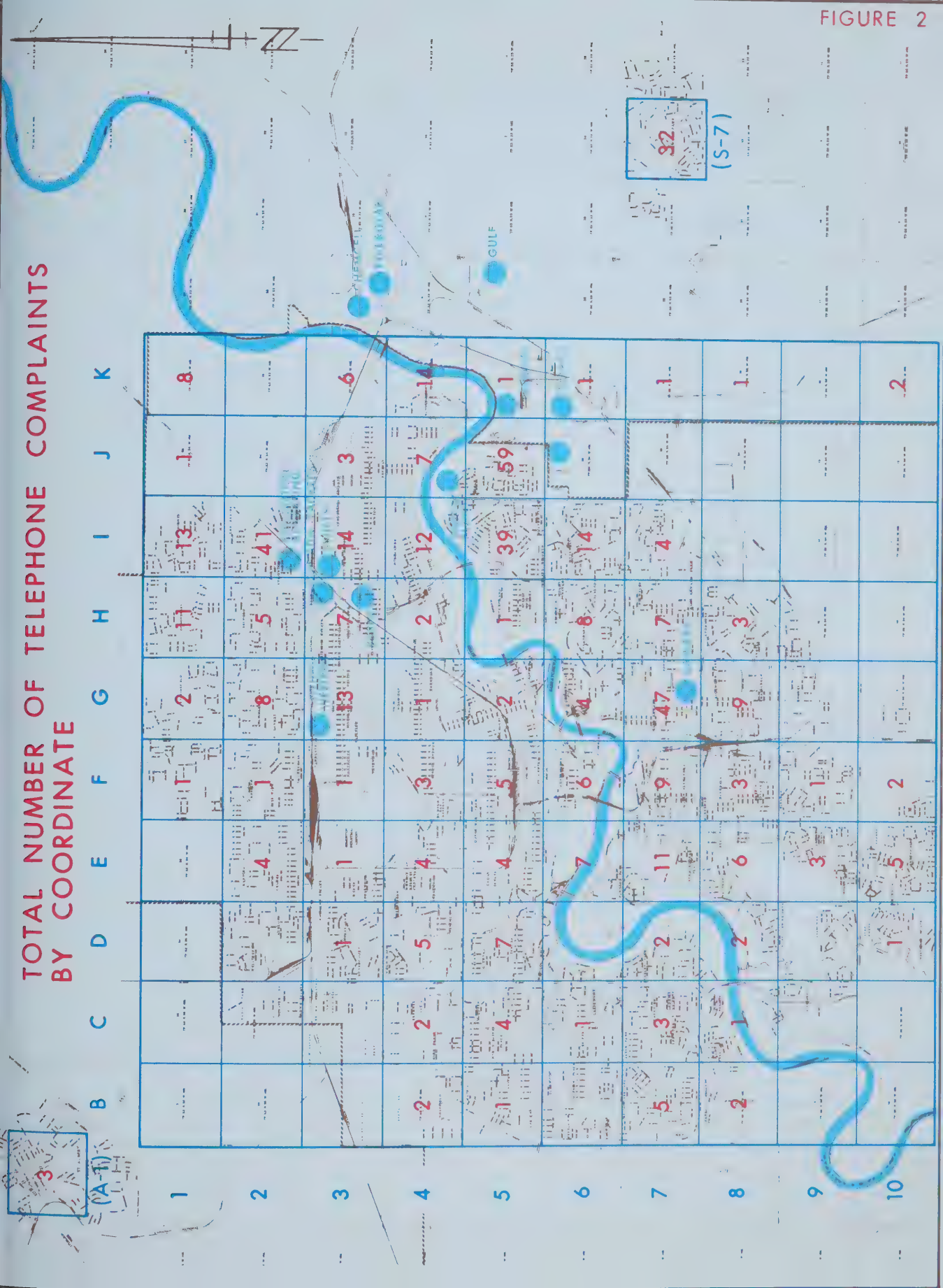
Table 6 summarizes the analysis of odor occurrences in the Household Survey by area.

**TABLE 6**  
**FREQUENCY OF ODOR OCCURRENCES BY AREA**  
**HOUSEHOLD SURVEY**

|                            | Number of<br>Observations | Number of<br>Odor<br>Occurrences | Odor As %<br>of Area<br>Observations | Average<br>Strength | Number of<br>Houses |
|----------------------------|---------------------------|----------------------------------|--------------------------------------|---------------------|---------------------|
| <b>Summer House Survey</b> |                           |                                  |                                      |                     |                     |
| Northeast Edmonton         | 1,286                     | 228                              | 18                                   | 2.9                 | 32                  |
| Southeast Edmonton         | 1,239                     | 190                              | 15                                   | 3.0                 | 33                  |
| Northwest Edmonton         | 749                       | 79                               | 11                                   | 2.8                 | 21                  |
| Southwest Edmonton         | 675                       | 47                               | 7                                    | 2.8                 | 17                  |
| St. Albert                 | 879                       | 111                              | 13                                   | 2.8                 | 21                  |
| Sherwood Park              | 775                       | 79                               | 10                                   | 2.7                 | 21                  |
| <b>Total Edmonton Area</b> | <b>5,603</b>              | <b>734</b>                       | <b>13</b>                            | <b>2.9</b>          | <b>145</b>          |
| <b>Winter House Survey</b> |                           |                                  |                                      |                     |                     |
| Northeast Edmonton         | 869                       | 83                               | 10                                   | 2.7                 | 22                  |
| Southeast Edmonton         | 954                       | 119                              | 12                                   | 2.6                 | 23                  |
| Northwest Edmonton         | 537                       | 47                               | 9                                    | 2.8                 | 14                  |
| Southwest Edmonton         | 379                       | 21                               | 6                                    | 2.4                 | 10                  |
| St. Albert                 | 467                       | 26                               | 6                                    | 3.1                 | 13                  |
| Sherwood Park              | 407                       | 28                               | 7                                    | 2.6                 | 12                  |
| <b>Total Edmonton Area</b> | <b>3,613</b>              | <b>324</b>                       | <b>9</b>                             | <b>2.7</b>          | <b>94</b>           |

# TOTAL NUMBER OF TELEPHONE COMPLAINTS BY COORDINATE

FIGURE 2





Metropolitan Edmonton was subdivided further into 100 grid areas plus St. Albert and Sherwood Park. Figure 2 shows the number of total telephone complaints received in each grid area throughout the Telephone Complaint Survey. From this data, the serious odor problems appear to be concentrated in four specific locations:

- a) The area centered on Hardisty, south of the river between 75th Street and 34th Street, and bounded on the south by 101st Avenue (i.e. I-5 and J-5).
- b) The extreme northeast area of Edmonton between 66th Street and 50th Street, and between 118th Avenue and 152nd Avenue (i.e. I-1, I-2, I-3).
- c) The Ritchie area between 96th Avenue and 76th Avenue, and between 101st Street and 91st Street (i.e. G-7).
- d) Sherwood Park.

It should be noted that the portions of I-4 and J-4 that lie south of the river were considered in the area analysis to be in I-5 and J-5. In other words, complaints and odor occurrences that were recorded in these small sections of Southeast Edmonton were accumulated into I-5 and J-5. Thus I-4 and J-4 in the Study are actually smaller than the square mile area shown on the figures.



## **SOUTHEAST EDMONTON**

Southeast Edmonton was defined as the section of the City which extends east from 101st Street and lies south of the North Saskatchewan River. Overall, this area appears to have the worst odor pollution problem in the Edmonton area.

According to the Public Opinion Survey, residents of the area show the highest concern for odors and appear to be most bothered by them. This is confirmed by the Telephone Complaint Survey, in which 38% of all complaints came from Southeast Edmonton. The results of the Household Survey are only slightly less conclusive. This area ranks about equally with Northeast Edmonton as recording the greatest frequency of odor occurrences.

The eastern half of Edmonton is clearly subjected to the strongest odors in the metropolitan area. While there is little difference noted between the Southeast and Northeast in strength of odor, it appears that Southeast Edmonton has the largest amount of extremely annoying odors as evidenced by the high telephone response and strong concern recorded in the opinion poll.

Southeast Edmonton contains the 2 grid areas having the largest number of telephone complaints (J-5 and G-7), and the fourth largest complaint area (I-5).

### **1. Types of Odor**

Southeast Edmonton is affected most by four types of odors: automotive exhaust, chemical odors, meat processing, and sewage odors. Exhaust fumes were observed frequently although most occurrences were "barely noticeable" and they generated very few telephone complaints. Meat processing odors on the other hand, were complained about often in the Telephone Survey and were described in strong terms. However, this type of complaint was usually limited to within about one mile of the Ritchie area. Chemical odor also produced a strong response, and these odors tend to be much more widespread than any of the other odors.

### **2. Major Sources**

There are three major specific sources of odor in Southeast Edmonton: petrochemical plants, Gainers, and the Hardisty Sewage Plant.

Gainers is the most commonly mentioned source of odor in Southeast Edmonton. It accounts for almost all the odor complaints from G-7, where the plant is located. This odor is perceived as being very strong and offensive to those who are affected by it. Yet, it seems to be observed primarily only within one mile of the plant.

The next largest sources of odor are the petroleum/chemical plants located east of Edmonton. Of all the plants, C.I.L. received the greatest amount of specific mention. Petrochemical odors are observed across most of Southeast Edmonton, particularly when the wind is in an easterly or southeasterly direction. These odors are most strongly concentrated in Hardisty, Gold Bar, and Capilano (I-5 and J-5), and account for most of the odors that caused these two grid areas to register the largest number of telephone complaints.

The other significant source of odor in Southeast Edmonton is the Hardisty Sewage Treatment Plant. Almost all observations of this odor were confined to a limited area of Gold Bar in J-5.

## **NORTHEAST EDMONTON**

Northeast Edmonton was defined as the section of the City which extends east from 97th Street and lies north of the river.

The concern for odor pollution in Northeast Edmonton ranks with the Southeast as being the greatest in the City, although most of the evidence indicates that the problem is less severe in Northeast Edmonton.

Northeast Edmonton contains one grid area with extremely high incidence of telephone complaints and odor occurrences (I-2). The communities immediately north and south of I-2 also have substantial odor occurrences as do K-4 (Rundle Heights) and G-3.

### **1. Types of Odor**

Three types of odor create most of the problem in Northeast Edmonton: exhaust fumes, meat processing, and chemical odors. Exhaust fumes are observed often and over a wide area. As in Southeast Edmonton, they are perceived as being not particularly strong or offensive, and generated no telephone complaints. On the other hand, meat processing odors were described in very strong terms. These odors constitute a much higher percentage of complaints and odor occurrences than in Southeast Edmonton, and they are observed over a wider area. Chemical odors are also perceived as being strong. In contrast to Southeast Edmonton, though, these odors are not observed as widely throughout the area, but tend to be concentrated in the southeast regions of Northeast Edmonton.

## **2. Seasonal Influence**

There is a strong seasonal influence on odors in Northeast Edmonton. The frequency of odor occurrence in the Household Survey was almost twice as great in the Summer as opposed to the Winter. Even more dramatic were the telephone complaint results, where the frequency of complaints from September to December was less than 25% of the frequency in the Spring and Summer months.

Two factors help to decrease the odors in the Winter months. Foremost was a drastic reduction in the number of meat processing odor occurrences after September. This phenomena was noted throughout Edmonton. Secondly, there was a large decline in chemical odors observed in Northeast Edmonton after August, likely because of the low incidence of southeasterly winds in the latter part of the year.

## **3. Major Sources**

There are three major specific sources of odor in Northeast Edmonton: meat processing plants, petroleum/chemical plants, and Anthes Western.

By far the greatest source of annoying odors are the meat processing plants around the Fort Road. Most of the specific complaints involved the rendering plant, which accounted for a large percentage of the odors observed in I-2, where the plant is located. The three meat packing plants also received considerable mention as sources of odor, although the residents of Northeast Edmonton were not nearly as specific as Southeast Edmonton in identifying the exact source (undoubtedly because there is only one packing plant in the Southeast).

The refineries and chemical plants were the other major sources mentioned by the residents of Northeast Edmonton. Here, Chemcell and Fiberglas received the largest amount of specific complaint. These odors are not concentrated in any grid area, but are mainly limited to the east half of Northeast Edmonton.

Anthes Western is the other significant specific source of odor. It accounts for most of the complaints in G-3, and is only observed in close proximity to the plant.

## **SHERWOOD PARK**

Sherwood Park is primarily a residential, suburban community without any major source of odor. Nevertheless, this area ranks after Southeast and Northeast Edmonton as having the most serious odor problems in the Edmonton area.

### **1. Types of Odor**

Two types of odor dominate Sherwood Park: chemical odors and rotten eggs. These odors are observed over most of Sherwood Park, except for the extreme east and southeast of the area. It is interesting to note that while these odors are not perceived as being particularly noticeable in the Household Survey, the telephone complaints often described them as being very strong. This is probably because the weather conditions which increase the intensity of odors in this area were not evident during the limited time of the Household Survey. Sherwood Park is less bothered by automotive exhaust fumes than any other area of Edmonton.

### **2. Seasonal Influence**

There was a noticeable seasonal influence to the odor occurrences in Sherwood Park, which was opposite to that observed elsewhere. That is, odors appear to be more prevalent in Winter than Summer. More than half the telephone complaints came in the three months from October to December. Furthermore, Sherwood Park was the only area which showed an increase in the frequency of chemical odor occurrences in the Winter Household Survey versus the Summer survey, and was the only area which stated in the Public Opinion Survey that odors were more serious in Winter. This is possibly due to the effect of wind direction which tends to shift from southerly in Summer to westerly in Winter, and to temperature inversions which occur more frequently in Winter and appear to increase the observation of chemical type odors.

### **3. Major Sources**

The dominant sources of odor in Sherwood Park are the refineries, Chemcell and Fiberglas. Most of the odor observations that identified a source mentioned one of these three specific locations.

## **NORTHWEST EDMONTON**

Northwest Edmonton was defined as the section which extends west from 97th Street, and which lies north of the river to the Groat Bridge and north of 101st Avenue, west of the bridge.

This area is relatively free of serious odor problems. There were no grid areas in Northwest Edmonton with large numbers of telephone complaints, although the communities from the City centre westward along 101st Avenue to Glenora received most of the complaints.

Exhaust fumes and wood smoke constitute the majority of odor occurrences in Northwest Edmonton. These are quite widely distributed throughout the area, and are generally not considered to be particularly offensive. Of secondary importance is the incidence of chemical and sewage odors. These produced the largest number of telephone complaints and were usually observed to be quite noticeable.

No single source contributed to any significant number of complaints. The petroleum and chemical odors which bother the east half of Edmonton are not generally identified in Northwest Edmonton. Sanitary sewers were the most common specific complaints, and these occurred widely throughout the southern portion of this area.

## **SOUTHWEST EDMONTON**

Southwest Edmonton was defined as the section of the City which extends west from 101st Street, and which lies south of the river to the Groat Bridge then south of 101st Avenue.

Like the Northwest, this area has relatively few odor problems. While the number of telephone complaints in Southwest Edmonton equalled the Northwest, the frequency of odor occurrences in the house surveys was the lowest of all Edmonton areas.

There were no grid areas in Southwest Edmonton with large numbers of telephone complaints or odor occurrences. Most of the complaints came from the Strathcona and University districts.

Most of the odor occurrences observed in the Household Survey were of exhaust fumes and wood smoke. These odors were widely observed throughout the area, and were not very strong. Wood smoke caused almost half the odors observed in the Winter survey, which likely is due to the prevalence of wood burning fireplaces in this relatively affluent and residential section of the City.



As in the Northwest, chemical and sewage odors were the most common odors observed in the Telephone Complaint Survey. These were generally perceived to be quite strong. Most of the chemical odors were noted in the Northwest part of this area. Sewage odors were widely observed.

No single source contributed large numbers of complaints. Odors from the chemical plants and refineries were seldom identified specifically. Sanitary sewers were the most frequently identified complaints, mostly occurring in the west half of the area.

## **ST. ALBERT**

St. Albert is relatively free of strong odors. There were only three telephone complaints from this area. Even on a per capita basis this response is the lowest in the Edmonton area. As with the west side of Edmonton, most odor occurrences observed in the other surveys originated from automotive exhaust and wood smoke, and these odors were generally not very noticeable.

The sources of odor in St. Albert tend to be local and not widely observed. The sewage lift station and a local incinerator were noted, but only in the immediate vicinity of the source. Chemical and meat processing odors are rare. None of the east-end Edmonton sources were specifically mentioned in any occurrence survey.

## SECTION 5

### EFFECT OF REPETITIVE TELEPHONE COMPLAINTS

A total of 371 people made 522 valid telephone complaints from March 27th to December 31st, 1972 (or about 2 complaints per day). Of these people, 83 complained more than once, and registered 105 complaints that were duplicates of an earlier complaint (i.e. other occurrences were noted by the same person about the same type and source of odor). Thus, there were 417 unique complaints from 371 people.

Fifty-nine of the repetitive complainers telephoned two or three times. However, five people complained seven times each, one complained six times and four complained five times. Only one of these callers made the same complaint on every call. Many of them complained about three or more different odors over a considerable time span during the nine month period. Furthermore, these people generally registered very factual, unemotional complaints.

We can conclude, then, that few of the repetitive callers were chronic complainers with a specific axe to grind. It is probable that those who complained on several occasions over the period were concerned about odor pollution, and had retained the telephone number for reference to register a complaint on those occasions when odors were particularly noticeable in their area.

When duplicate complaints are eliminated from the analysis, a plot of complaint frequency versus grid area does not show any significant change from the original plot of all telephone complaints. Figure 3 shows the distribution of the total number of different telephone callers by grid area, as compared with the distribution of total telephone complaints shown on Figure 2 (following Page 29).

# TOTAL NUMBER OF DIFFERENT TELEPHONE CALLERS IN EACH COORDINATE

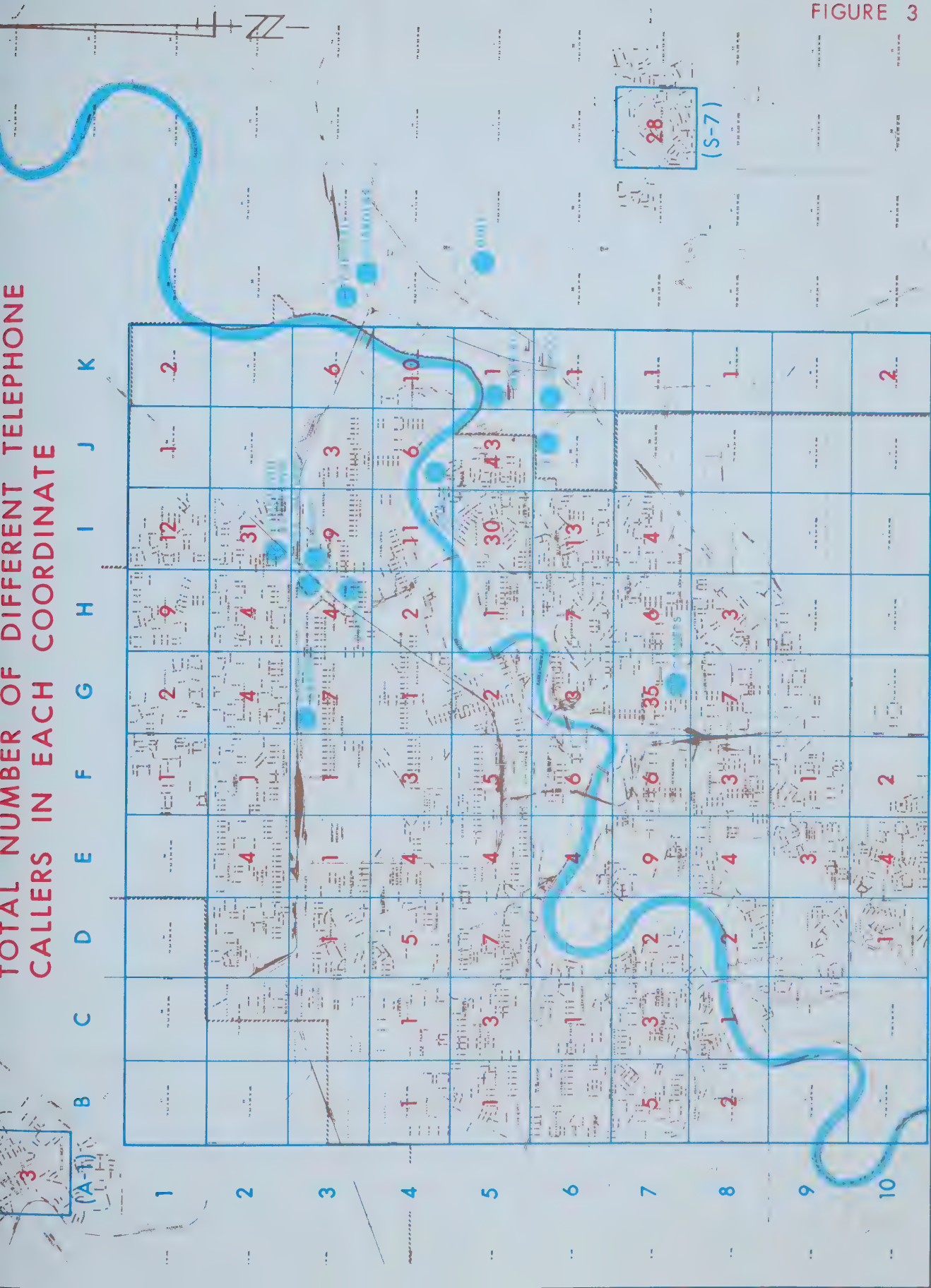


FIGURE 3



The five grid areas with the largest number of telephone complaints retain their order of ranking in both figures, and the top thirteen areas (those with more than ten telephone complaints) are still the worst thirteen areas after adjusting for duplicate complaints, although the ranking of the latter eight are slightly altered within the group. Table 7 lists these grid areas in descending order of number of telephone complaints, and shows the effect of eliminating duplicate calls.

**TABLE 7**  
**GRID AREAS WITH HIGHEST**  
**NUMBER OF TELEPHONE COMPLAINTS**  
**(IN ORDER OF TOTAL COMPLAINTS)**

| Grid Areas | Total Complaints | Total Callers |
|------------|------------------|---------------|
| J-5        | 59               | 43            |
| G-7        | 47               | 35            |
| I-2        | 41               | 31            |
| I-5        | 39               | 30            |
| S-7        | 32               | 28            |
| I-6        | 14               | 13            |
| K-4        | 14               | 10            |
| I-3        | 14               | 9             |
| I-1        | 13               | 12            |
| G-3        | 13               | 7             |
| I-4        | 12               | 11            |
| H-1        | 11               | 9             |
| E-7        | 11               | 9             |



## SECTION 6

### IDENTIFICATION OF SPECIFIC ODOR SOURCES IN THE EDMONTON AREA

#### GENERAL

Under the Terms of Reference of the Odor Study, one objective was to determine the locations from which odorous materials are being released in the Edmonton area, and to note the extent to which these odors are noticeable. One method of achieving this objective, which was considered early in the Study, is to take a panel of judges into the field to make observations in the vicinity of specific odor sources. It was decided that this method would probably not result in any better identification of the sources than was already being obtained by the other surveys, and would be quite expensive. As a result, the identification of odor sources depends primarily on the data obtained by the Telephone Complaint Survey, and supplemented by the information from the Odor Occurrence Surveys and the Opinion Survey.

Automotive exhaust is the greatest source of odor in Edmonton. However, specific sources of exhaust fume odors were rarely identified except in vague general terms such as "traffic". In most cases, the source of exhaust fumes is only implied and not noted specifically. For this reason, analysis of the sources of exhaust fumes has been excluded from this section which deals only with specific, identified odor sources.

By far, the most common specific sources of odor identified in the Edmonton area were associated with petroleum or chemical plants, and with the meat processing industry. Other sources identified by a substantial number of residents include the Hardisty Sewage Plant, the Anthes Western Foundry, and sanitary sewers. Table 8 lists the number of telephone complaints identifying each specific source, and breaks down the frequency by area. Tables 9, 10 and 11 show the similar source information that was obtained from the Household Survey and the Fire Hall Survey.

**TABLE 8**  
**IDENTIFIED SOURCES OF ODOR**  
**TELEPHONE COMPLAINTS**

|                           | Number of Complaints for Each Source |    |    |    |               |                  | Total | * % of<br>Total<br>Complaints |
|---------------------------|--------------------------------------|----|----|----|---------------|------------------|-------|-------------------------------|
|                           | NE                                   | SE | NW | SW | St.<br>Albert | Sherwood<br>Park |       |                               |
| Petro/Chem                |                                      |    |    |    |               |                  |       |                               |
| Chemical Plant            | 12                                   | 14 | 3  | 5  |               | 1                | 35    | 6.7                           |
| Refinery                  | 7                                    | 13 | 2  | 1  |               | 7                | 30    | 5.7                           |
| Chemical Row              | 4                                    | 12 |    | 1  |               | 4                | 21    | 4.0                           |
| Fiberglas                 | 8                                    | 1  |    | 1  |               | 6                | 16    | 3.1                           |
| Chemcell                  | 5                                    | 6  | 3  |    |               | 1                | 15    | 2.9                           |
| C.I.L.                    | 1                                    | 10 |    |    |               |                  | 11    | 2.1                           |
| Gulf Refinery             | 4                                    |    |    |    |               | 1                | 5     | 1.0                           |
| Imperial Oil              | 1                                    |    | 1  |    |               |                  | 2     | 0.4                           |
| Total Petro/Chem          | 42                                   | 56 | 9  | 8  | 0             | 20               | 135   | 25.9                          |
| Meat Processing           |                                      |    |    |    |               |                  |       |                               |
| Gainers                   |                                      | 53 |    | 2  |               |                  | 55    | 10.5                          |
| Rendering Plant           | 32                                   |    |    |    |               |                  | 32    | 6.1                           |
| Packing Plant             | 21                                   | 2  |    | 1  |               |                  | 24    | 4.6                           |
| Tannery                   | 8                                    |    |    |    |               |                  | 8     | 1.5                           |
| Swifts                    | 5                                    |    |    |    |               |                  | 5     | 1.0                           |
| Stock Yards               | 3                                    | 1  |    |    |               |                  | 4     | 0.8                           |
| Burns                     | 2                                    |    |    |    |               |                  | 2     | 0.4                           |
| Canada Packers            |                                      |    | 1  |    |               |                  | 1     | 0.2                           |
| Total Meat Processing     | 71                                   | 56 | 1  | 3  | 0             | 0                | 131   | 25.1                          |
| Other Major Sources       |                                      |    |    |    |               |                  |       |                               |
| Sewage Plant              |                                      | 28 |    |    |               |                  | 28    | 5.4                           |
| Sewer                     | 4                                    | 4  | 10 | 9  |               |                  | 27    | 5.2                           |
| Anthes Western            | 13                                   |    |    |    |               |                  | 13    | 2.5                           |
| City Lagoon               | 8                                    |    |    |    |               |                  | 8     | 1.5                           |
| Total Other Major Sources | 25                                   | 32 | 10 | 9  | 0             | 0                | 76    | 14.6                          |

TABLE 8 (Cont'd)

|                       | Number of Complaints for Each Source |     |    |    |               |                  | Total | * % of<br>Total<br>Complaints |
|-----------------------|--------------------------------------|-----|----|----|---------------|------------------|-------|-------------------------------|
|                       | NE                                   | SE  | NW | SW | St.<br>Albert | Sherwood<br>Park |       |                               |
| Miscellaneous Sources |                                      |     |    |    |               |                  |       |                               |
| Plant                 | 4                                    | 1   |    |    |               | 1                | 6     | 1.1                           |
| Incinerator           |                                      |     | 3  | 2  |               |                  | 5     | 1.0                           |
| Farm                  | 1                                    | 2   |    |    | 1             |                  | 4     | 0.8                           |
| NADP Dairy            |                                      | 1   | 2  |    |               |                  | 3     | 0.6                           |
| Building Products     | 1                                    | 2   |    |    |               |                  | 3     | 0.6                           |
| Bateman's IGA         |                                      |     |    | 3  |               |                  | 3     | 0.6                           |
| Turbo Industries      |                                      | 2   |    |    |               |                  | 2     | 0.4                           |
| Beverly Dump          | 2                                    |     |    |    |               |                  | 2     | 0.4                           |
| City Dump             | 1                                    |     | 1  |    |               |                  | 2     | 0.4                           |
| Safeway               |                                      | 1   | 1  |    |               |                  | 2     | 0.4                           |
| Dome Petroleum        |                                      |     |    | 1  |               | 1                | 2     | 0.4                           |
| University Farm       |                                      |     |    | 2  |               |                  | 2     | 0.4                           |
| Neighbour             |                                      |     |    | 1  |               |                  | 2     | 0.4                           |
| Park Plaza            |                                      |     | 1  |    |               |                  | 1     | 0.2                           |
| O'Keefe Brewery       |                                      |     |    | 1  |               |                  | 1     | 0.2                           |
| Caravan Hotel         |                                      |     | 1  |    |               |                  | 1     | 0.2                           |
| Ukranian Cooking      |                                      |     |    | 1  |               |                  | 1     | 0.2                           |
| Park Manor            |                                      |     | 1  |    |               |                  | 1     | 0.2                           |
| Stelco                | 1                                    |     |    |    |               |                  | 1     | 0.2                           |
| Calder Yards          |                                      |     | 1  |    |               |                  | 1     | 0.2                           |
| Propane Bottles       |                                      |     |    | 1  |               |                  | 1     | 0.2                           |
| Savage Clinic         |                                      |     |    | 1  |               |                  | 1     | 0.2                           |
| Feed Lot              |                                      |     |    | 1  |               |                  | 1     | 0.2                           |
| Garbage Truck         |                                      |     | 1  |    |               |                  | 1     | 0.2                           |
| Foundry               | 1                                    |     |    |    |               |                  | 1     | 0.2                           |
| Restaurant            |                                      |     | 1  |    |               |                  | 1     | 0.2                           |
| Construction          |                                      |     |    | 1  |               |                  | 1     | 0.2                           |
| General Hospital      |                                      |     | 1  |    |               |                  | 1     | 0.2                           |
| Pipeline              |                                      | 1   |    |    |               |                  | 1     | 0.2                           |
| Total Miscellaneous   | 12                                   | 10  | 14 | 15 | 1             | 2                | 54    | 10.3                          |
| Total Sources         | 150                                  | 154 | 34 | 35 | 1             | 22               | 396   | 75.9                          |
| No Source Identified  | 21                                   | 46  | 25 | 22 | 2             | 10               | 126   | 24.1                          |
| TOTAL COMPLAINTS      | 171                                  | 200 | 59 | 57 | 3             | 32               | 522   | 100.0                         |

\*Sum of individual percentages may not equal total percentage due to rounding.

## IDENTIFIED SOURCES OF ODOR OCCURRENCES

## SUMMER HOUSEHOLD SURVEY

|                       | Number of Occurrences for Each Source |     |    |    |               |                  | Total | * % of<br>Total<br>Complaints |
|-----------------------|---------------------------------------|-----|----|----|---------------|------------------|-------|-------------------------------|
|                       | NE                                    | SE  | NW | SW | St.<br>Albert | Sherwood<br>Park |       |                               |
| Petro/Chem            |                                       |     |    |    |               |                  |       |                               |
| C.I.L.                |                                       | 18  |    |    |               |                  | 18    | 2.5                           |
| Chemcell              | 11                                    | 1   |    |    |               | 5                | 17    | 2.3                           |
| Refinery              |                                       | 2   |    |    |               | 3                | 5     | 0.7                           |
| Chemical Row          | 3                                     | 2   |    |    |               |                  | 5     | 0.7                           |
| Chemical Plant        | 4                                     | 4   |    |    | 1             |                  | 9     | 1.2                           |
| Total Petro/Chem      | 18                                    | 27  | 0  | 0  | 1             | 8                | 54    | 7.4                           |
| Meat Processing       |                                       |     |    |    |               |                  |       |                               |
| Gainers               |                                       | 19  |    |    |               |                  | 19    | 2.6                           |
| Packing Plant         | 9                                     |     | 1  |    |               |                  | 10    | 1.4                           |
| Swifts                | 6                                     |     |    |    |               |                  | 6     | 0.8                           |
| Stock Yards           | 5                                     |     |    |    |               |                  | 5     | 0.7                           |
| Burns                 | 4                                     |     |    |    |               |                  | 4     | 0.5                           |
| Rendering Plant       | 2                                     |     |    |    |               |                  | 2     | 0.3                           |
| Total Meat Processing | 26                                    | 19  | 1  | 0  | 0             | 0                | 46    | 6.3                           |
| Miscellaneous         |                                       |     |    |    |               |                  |       |                               |
| Sewage Plant          | 1                                     | 13  |    |    |               |                  | 14    | 1.9                           |
| Building Products     |                                       | 10  |    |    |               |                  | 10    | 1.4                           |
| Construction          |                                       |     |    |    |               | 8                | 8     | 1.1                           |
| Zeidler Plywood       |                                       |     |    | 4  |               |                  | 4     | 0.5                           |
| Exhibition Grounds    | 3                                     |     |    |    |               |                  | 3     | 0.4                           |
| Neighbour             |                                       |     | 1  | 1  |               |                  | 2     | 0.3                           |
| Beverly Dump          | 2                                     |     |    |    |               |                  | 2     | 0.3                           |
| Safeway               |                                       |     |    | 1  |               |                  | 1     | 0.1                           |
| St. Albert Lagoon     |                                       |     |    |    | 1             |                  | 1     | 0.1                           |
| Total Miscellaneous   | 6                                     | 23  | 1  | 6  | 1             | 8                | 45    | 6.1                           |
| Total Sources         | 50                                    | 69  | 2  | 6  | 2             | 16               | 145   | 19.8                          |
| No Source Identified  | 178                                   | 121 | 77 | 41 | 109           | 63               | 589   | 80.2                          |
| TOTAL OCCURRENCES     | 228                                   | 190 | 79 | 47 | 111           | 79               | 734   | 100.0                         |

\*Sum of individual percentages may not equal total percentage due to rounding.

**TABLE 10**  
**IDENTIFIED SOURCES OF ODOR OCCURRENCES**  
**WINTER HOUSEHOLD SURVEY**

|                       | Number of Occurrences for Each Source |     |    |    |               |                  | Total | * % of<br>Total<br>Complaints |
|-----------------------|---------------------------------------|-----|----|----|---------------|------------------|-------|-------------------------------|
|                       | NE                                    | SE  | NW | SW | St.<br>Albert | Sherwood<br>Park |       |                               |
| Petro/Chem            |                                       |     |    |    |               |                  |       |                               |
| Refinery              |                                       | 2   |    |    |               | 8                | 10    | 3.1                           |
| Chemcell              |                                       |     |    |    |               | 3                | 3     | 0.9                           |
| Chemical Row          |                                       | 3   |    |    |               |                  | 3     | 0.9                           |
| Chemical Plant        |                                       | 2   |    |    |               |                  | 2     | 0.6                           |
| Total Petro/Chem      | 0                                     | 7   | 0  | 0  | 0             | 11               | 18    | 5.5                           |
| Meat Processing       |                                       |     |    |    |               |                  |       |                               |
| Gainers               |                                       | 7   |    |    |               |                  | 7     | 2.2                           |
| Packing Plant         | 3                                     |     |    |    |               |                  | 3     | 0.9                           |
| Swifts                | 2                                     |     |    |    |               |                  | 2     | 0.6                           |
| Total Meat Processing | 5                                     | 7   | 0  | 0  | 0             | 0                | 12    | 3.7                           |
| Miscellaneous         |                                       |     |    |    |               |                  |       |                               |
| Fireplace             |                                       |     |    | 4  | 2             |                  | 6     | 1.9                           |
| Construction          | 1                                     |     |    |    | 3             | 1                | 5     | 1.5                           |
| CNR                   |                                       |     | 2  |    |               |                  | 2     | 0.6                           |
| Neighbour             |                                       |     |    | 2  |               |                  | 2     | 0.6                           |
| Safeway Incinerator   |                                       |     | 1  |    |               |                  | 1     | 0.3                           |
| Sewer                 |                                       |     | 1  |    |               |                  | 1     | 0.3                           |
| Foundry               |                                       | 1   |    |    |               |                  | 1     | 0.3                           |
| Zeidler Plywood       |                                       | 1   |    |    |               |                  | 1     | 0.3                           |
| Total Miscellaneous   | 1                                     | 2   | 4  | 6  | 5             | 1                | 19    | 5.9                           |
| Total Sources         | 6                                     | 16  | 4  | 6  | 5             | 12               | 49    | 15.1                          |
| No Source Identified  | 77                                    | 103 | 43 | 15 | 21            | 16               | 275   | 84.9                          |
| TOTAL OCCURRENCES     | 83                                    | 119 | 47 | 21 | 26            | 28               | 324   | 100.0                         |

\*Sum of individual percentages may not equal total percentage due to rounding.



**TABLE 11**  
**IDENTIFIED SOURCES OF ODOR OCCURRENCES**  
**FIRE HALL SURVEY**

|                     | Number of Occurrences for Each Source |    |    |    |               |                  | Total | * % of<br>Total<br>Occurrences |
|---------------------|---------------------------------------|----|----|----|---------------|------------------|-------|--------------------------------|
|                     | NE                                    | SE | NW | SW | St.<br>Albert | Sherwood<br>Park |       |                                |
| Safeway Incinerator |                                       |    |    |    | 17            |                  | 17    | 5.2                            |
| Lions Park          |                                       |    |    |    | 9             |                  | 9     | 2.8                            |
| Lift Station        |                                       |    |    |    | 7             |                  | 7     | 2.2                            |
| Packing Plant       | 5                                     |    |    |    |               |                  | 5     | 1.5                            |
| Chemcell            |                                       |    | 1  |    |               | 1                | 2     | 0.6                            |
| Refinery            |                                       |    |    |    |               | 1                | 1     | 0.3                            |
| Incinerator         |                                       |    | 1  |    |               |                  | 1     | 0.3                            |
| Total Sources       | 5                                     | 0  | 2  | 0  | 33            | 2                | 42    | 12.9                           |
| No Source Given     | 84                                    | 7  | 91 | 20 | 51            | 30               | 283   | 87.1                           |
| TOTAL OCCURRENCES   | 89                                    | 7  | 93 | 20 | 84            | 32               | 325   | 100.0                          |

\*Sum of individual percentages may not equal total percentage due to rounding.

## PETROLEUM/CHEMICAL PLANTS

Petroleum and chemical plant sources of odor were identified more frequently than any other odor source. Complaints were received in all seasons and tended to be identified over a very wide area of the City. Some chemical odors were specifically identified from as far as ten miles away from the source.

### Chemical Row/Chemical Plant

Most of the telephone complaints identified the source of petroleum/chemical odors in general terms such as “chemical row”, “chemical plant”, “industrial complex east of City”, and “refinery or C.I.L.”. For purposes of this Study, identification of a vague chemical source such as “refinery or chemical plant” was labelled as “Chemical Row”. The term “Chemical Plant” was reserved for those complaints which referred to “chemical plant”, or to two or more specific chemical plants (but not if refinery was mentioned as a possible source). There were 56 telephone complaints of generalized petro/chemical plant sources from 51 people. Figure 4 shows the locations by grid area where these complaints were observed.

These sources of odor were observed widely throughout Edmonton, although they tended to concentrate in the Southeast and Northeast sections, as would be expected. They were commonly identified in the communities of Beverly, Gold Bar, Capilano, Hardisty, Ottewell and Sherwood Park. Identification of chemical plant sources was more widely distributed than identification of any other sources of odor, and occurred in all seasons.

Chemical Row/Chemical Plants were frequently identified in the Household Survey and Fire Hall Survey as well, although these latter surveys tended to be more specific in identifying chemical type odors.

# COMPLAINTS OF SPECIFIC ODOR SOURCES CHEMICAL ROW / CHEMICAL PLANT - TOTAL 56

B C D E F G H I J K



FIGURE 4



## **Refinery**

Refineries were specifically identified by 28 people on 37 telephone complaints. Figure 5 shows the distribution of these complaints by grid area. Identification of refinery odors was more localized than were the general chemical complaints. These complaints centered around Rundle Heights, Gold Bar, Capilano, and Sherwood Park.

Very few refinery complaints identified the specific refinery. Gulf was identified five times and Imperial Oil was named twice. In general, complaints against refineries were not as vociferous as those against specific chemical plants and the meat processing industry. Refineries were also identified frequently in the Household Survey and Fire Hall Survey, usually at locations in the general vicinity of the refineries (i.e. Sherwood Park and Gold Bar).

## **Fiberglas**

Fiberglas Canada Ltd. was identified uniquely on more telephone complaints than any other specific chemical or petroleum plant. A total of sixteen complaints were received from fourteen residents. Figure 6 shows the distribution of odors identified to this source. The odor from Fiberglas is observed most frequently in grid area K-3 (the immediate vicinity) where it is perceived very strongly, and in Sherwood Park where it is less strongly observed. There are no houses in K-3; these complaints were from people who work in the area or were driving past.

The odor is usually described in intense terms. It is a blue, choking, low-lying cloud that is particularly offensive, and is most often observed when the wind is from a northerly or northwesterly direction.

Fiberglas was not identified as the source of any odor occurrence in either the Household Survey or Fire Hall Survey, possibly because identification of this odor is quite localized.



## Chemcell

Chemcell (Celanese Canada Ltd.) was specifically identified as the source of 15 telephone complaints from 13 people. It is also mentioned along with other sources on several complaints where the specific plant was not uniquely identified (e.g. "possibly Chemcell or a refinery"). Figure 7 illustrates the pattern of identification of this source by grid area.

The interesting aspect about complaints which identify Chemcell is that they are not localized but widely distributed throughout the Edmonton area. Four of the thirteen residents complaining of this source were more than five miles from the plant, and no grid area had more than two people complain. The pattern of Chemcell complaints almost mirrored the general chemical plant complaints, which leads one to question whether the identification of Chemcell is sometimes influenced by the reputation of the plant. Undoubtedly, Chemcell contributes to some of the non-specific complaints, but it is also probable that Chemcell and chemical odors are linked historically in the minds of Edmontonians so that some odors which are identified as Chemcell may be from other sources.

Chemcell was also noted numerous times as the source of odor occurrence in the Household Survey. Again, the pattern of identification was similar to that for chemical plants in general, with this source being identified several miles away.

## C.I.L.

C.I.L. (Canadian Industries Ltd.) was identified uniquely on 11 telephone complaints by 11 different people. Like Fiberglas, identification of this source is quite localized. Most of these complaints came from the Gold Bar community, all others were in the 3 adjoining grid areas (see Figure 8). Some of the general chemical plant complaints also mentioned C.I.L. along with refineries or other chemical plants, and could not pin down the specific source. Many of the C.I.L. complaints were of a burnt plastic rather than a chemical type odor.

In general, although C.I.L. may contribute to a large number of chemical odors, these complaints are not as vociferous as those specifically identifying Fiberglas or Chemcell, and are not as distinctly identified (possibly due to its proximity to the refineries which makes specific identification more difficult).

# COMPLAINTS OF SPECIFIC ODOR SOURCES REFINERIES - TOTAL 37

B C D E F G H I J K

1 2 3 4 5 6 7 8 9 10



FIGURE 5





# COMPLAINTS OF SPECIFIC ODOR SOURCES FIBERGLAS - TOTAL 16

B C D E F G H I J K

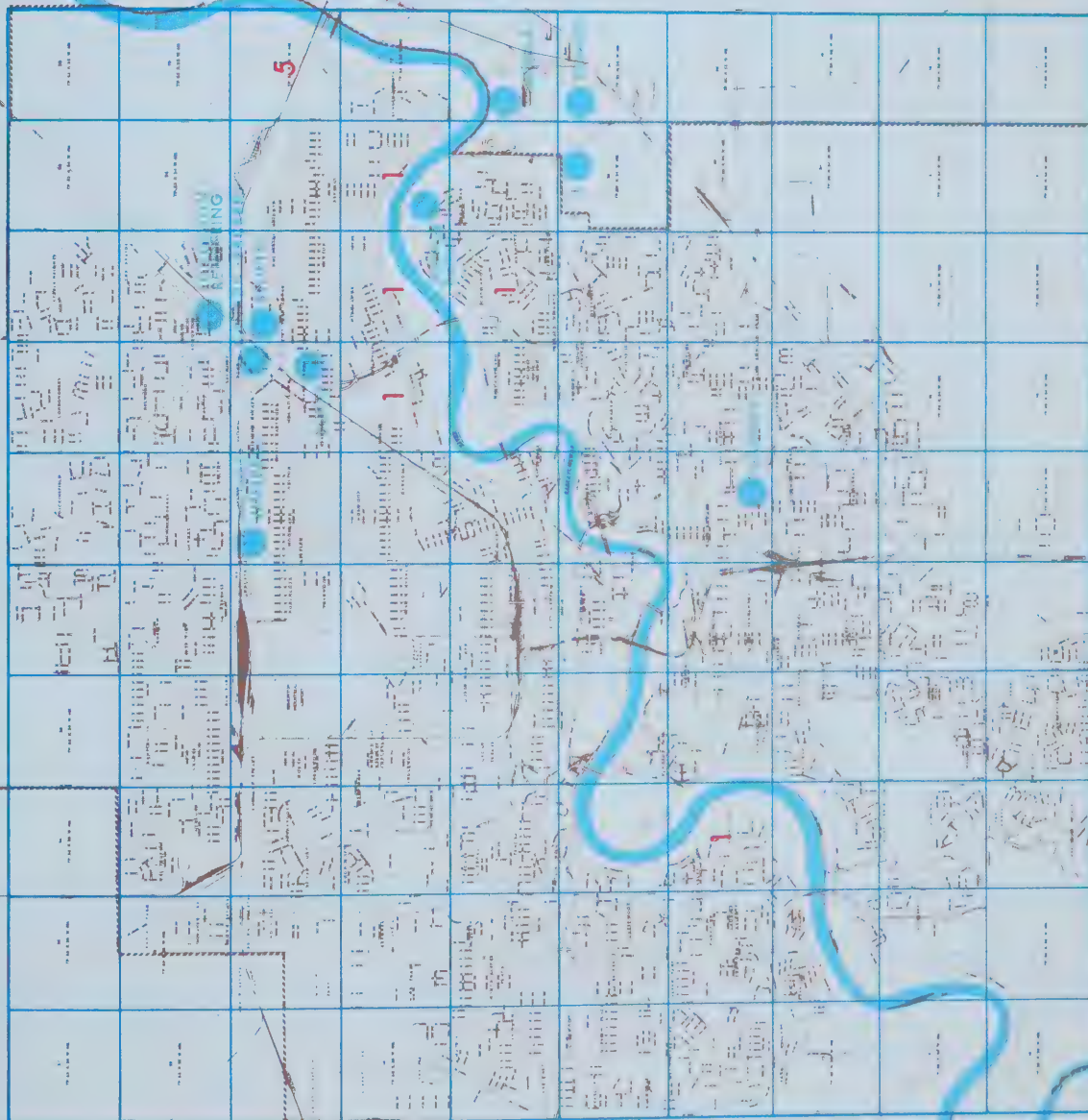


FIGURE 6





# COMPLAINTS OF SPECIFIC ODOR SOURCES CHEMCELL - TOTAL 15

B C D E F G H I J K

1

2

3

4

5

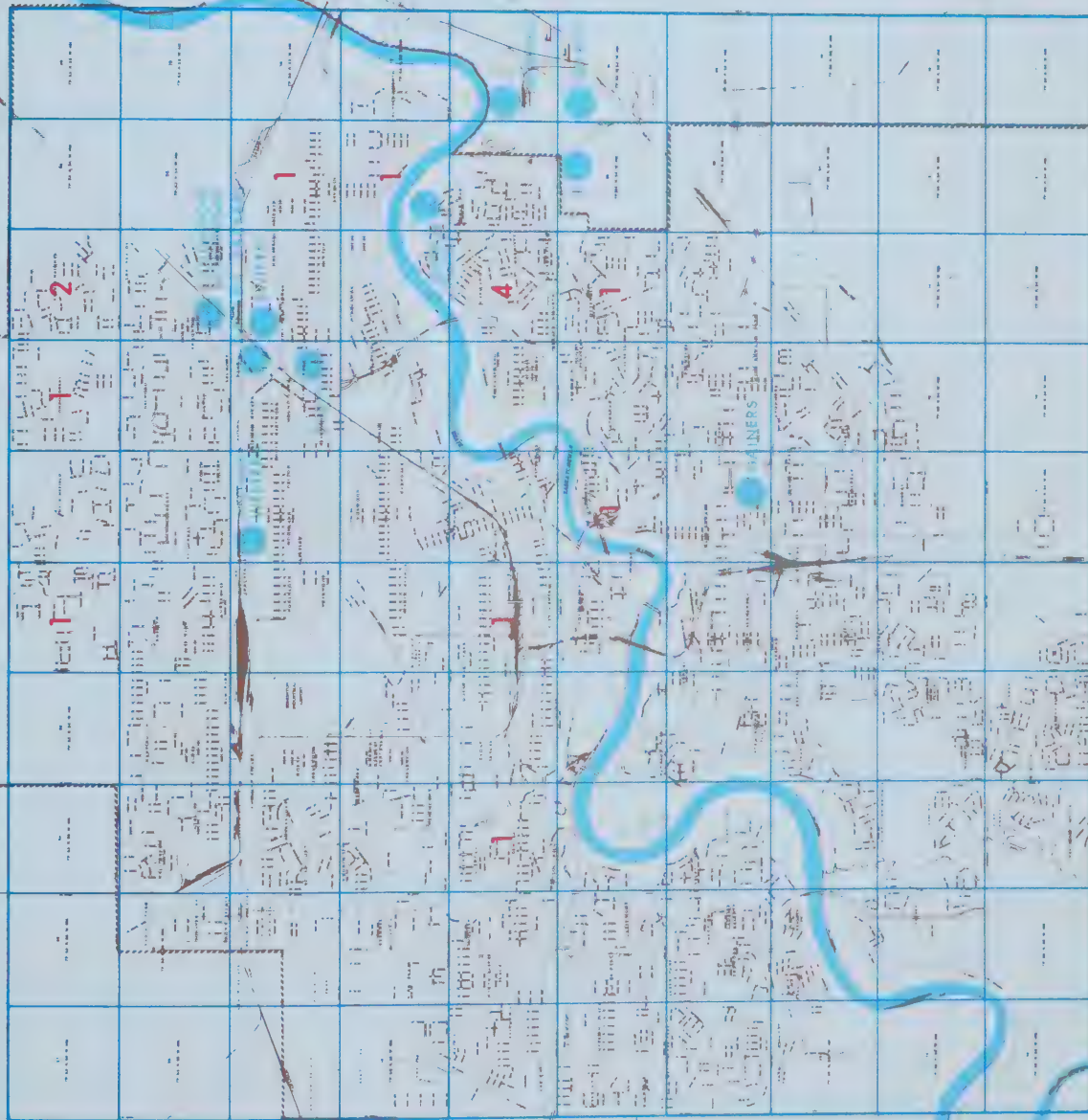
6

7

8

9

10

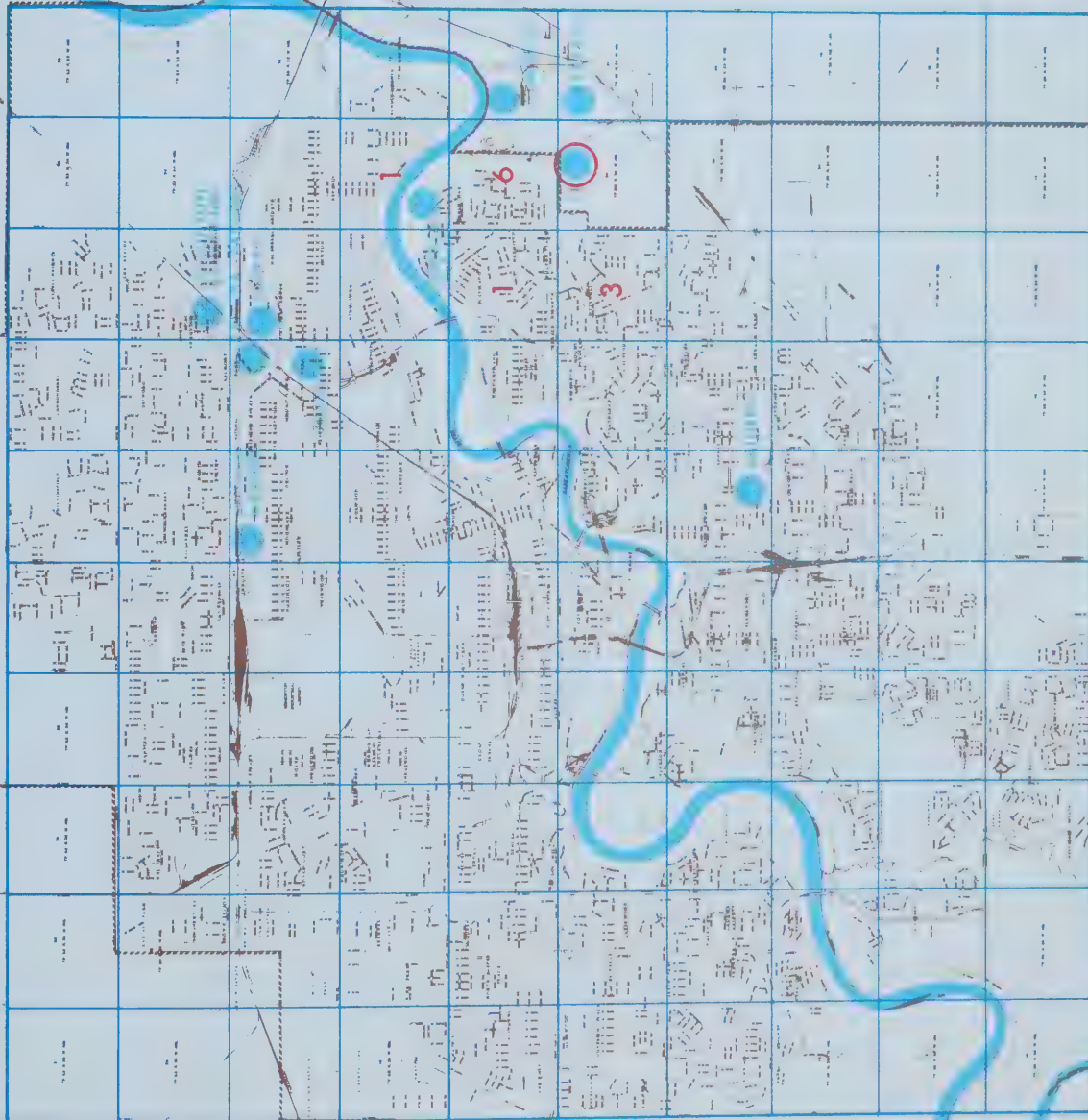




# COMPLAINTS OF SPECIFIC ODOR SOURCES CIL - TOTAL 11

B C D E F G H I J K

1 2 3 4 5 6 7 8 9 10







## MEAT PROCESSING INDUSTRY

Sources of meat processing odors were identified almost as often as petroleum/chemical sources. Some 25% of all telephone complaints identified a source of meat processing odor. However, almost all these complaints were in two areas of the City close to the odor source (i.e. in grid area G-7 and in Northeast Edmonton). While these odors are not distributed over wide areas of the City, the people who identified meat processing sources usually found the odors to be particularly offensive and described them in strong terms.

It is significant to note that almost all occurrences of meat processing odors in Southeast Edmonton are identified specifically to Gainers. A similar phenomenon was observed in Northeast Edmonton where the vast majority of meat processing odors are identified to some source. In contrast, many chemical odors are not specifically identified at all.

### Gainers

Gainers Limited was identified as the source of odor on more telephone complaints than any other specific source of odor in Edmonton. A total of 55 telephone complaints from 43 people identified this source (11% of all complaints). This is primarily because Gainers is the only source of meat processing odor on the south side of Edmonton in an area with no other major source of strong odor. In contrast, all the Northeast sources of meat processing odors are in close proximity to each other, making it difficult to identify a specific source.

31 of 43 people identifying Gainers were located in grid area G-7 within eight blocks of the plant. Figure 9 shows the location of these telephone complaints by grid area. There were no odors identified to Gainers from further than one grid area away (i.e. about one mile).

Gainers also led all other odor sources in the number of specific source identifications in the Summer Household Survey, and was identified more often than any other meat processing source in the Winter Household Survey. Again, the odor was observed and identified as Gainers only in the immediate vicinity of the plant. All identifications were in grid area G-7 and G-8, and the most distant identification in the Household Survey was located six blocks away. This confirms the results of the telephone survey which indicates that the odor from Gainers is particularly offensive to those in the immediate area, but it does not travel.



## **Edmonton Rendering**

Edmonton Rendering Co. Ltd. is the most commonly identified source of meat processing odor in Northeast Edmonton. 32 telephone complaints from 24 residents identified this source. Some of these complaints did not specifically state Edmonton Rendering, but identified the source in terms such as the “rendering plant on the Fort Road”, or “northeast rendering plant”.

Identification of this source of odor is very localized, with most complaints coming from within about eight blocks of the plant in grid area I-2. All other complaints of this source were located in the adjacent grid areas. The distribution of these telephone complaints is shown on Figure 10.

The Rendering Plant was seldom identified specifically in the Household Survey and Fire Hall Survey.

## **Tannery**

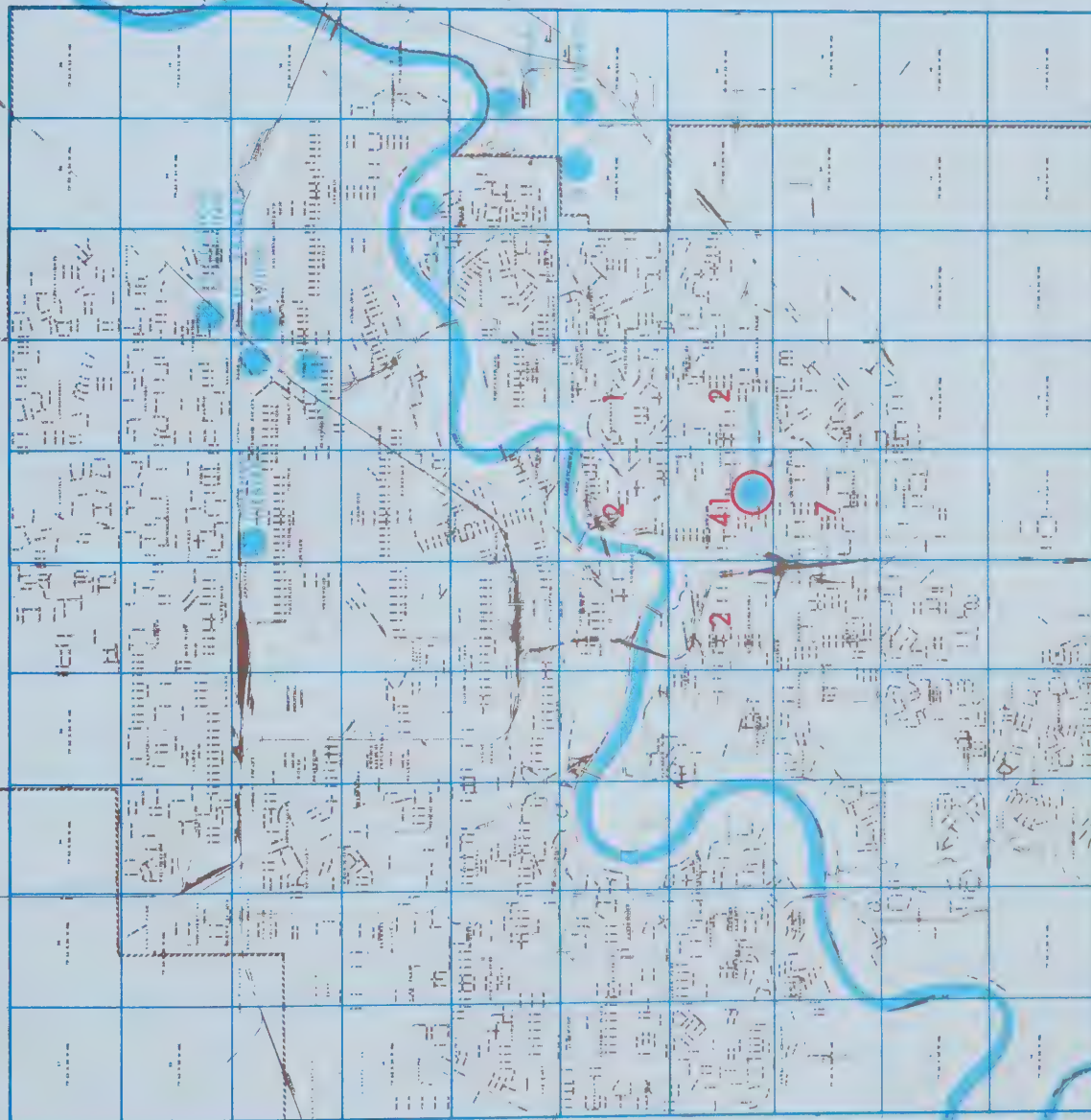
“Tannery” was identified as the source of odor on eight telephone complaints by six residents, all but one of these residents residing in grid area I-2. An interesting observation is that each of these occurrences was within four blocks of Edmonton Rendering, and about four times as far from Dominion Tanners Ltd. This leads one to suspect that the identity of this source has been made in error by people who could not accurately distinguish between the two sources.

## **Packing Plant**

“Packing Plant” was identified as the source of odor by 25 people on 32 telephone complaints. Only 8 of these complaints specifically identified a particular plant (i.e. Burns Foods Ltd., Swift Canadian Co. Ltd., or Canadian Packers Ltd.), undoubtedly because the closeness of the three plants makes it difficult to distinguish the specific source. Moreover, it is likely that there is confusion in identification between the meat packing plants and the rendering plant. Figure 11 shows the distribution of complaints that identified a packing plant as the source of odor. It can be seen that these complaints are more widely distributed than those identifying the rendering plant, tannery, or Gainers as specific sources. It is interesting to note that only one of the general packing plant complaints is likely to have originated from the Gainers plant; all other general packing plant complaints were located close to the northeast sources of meat processing odors.

Packing plants were frequently identified as the source of meat processing odors in the Household Survey and the Fire Hall Survey. About half of these identified either Swift or Burns as the specific source.

B C D E F G H I J K



(S-7)





# COMPLAINTS OF SPECIFIC ODOR SOURCES RENDERING PLANT - TOTAL 32

B C D E F G H I J K



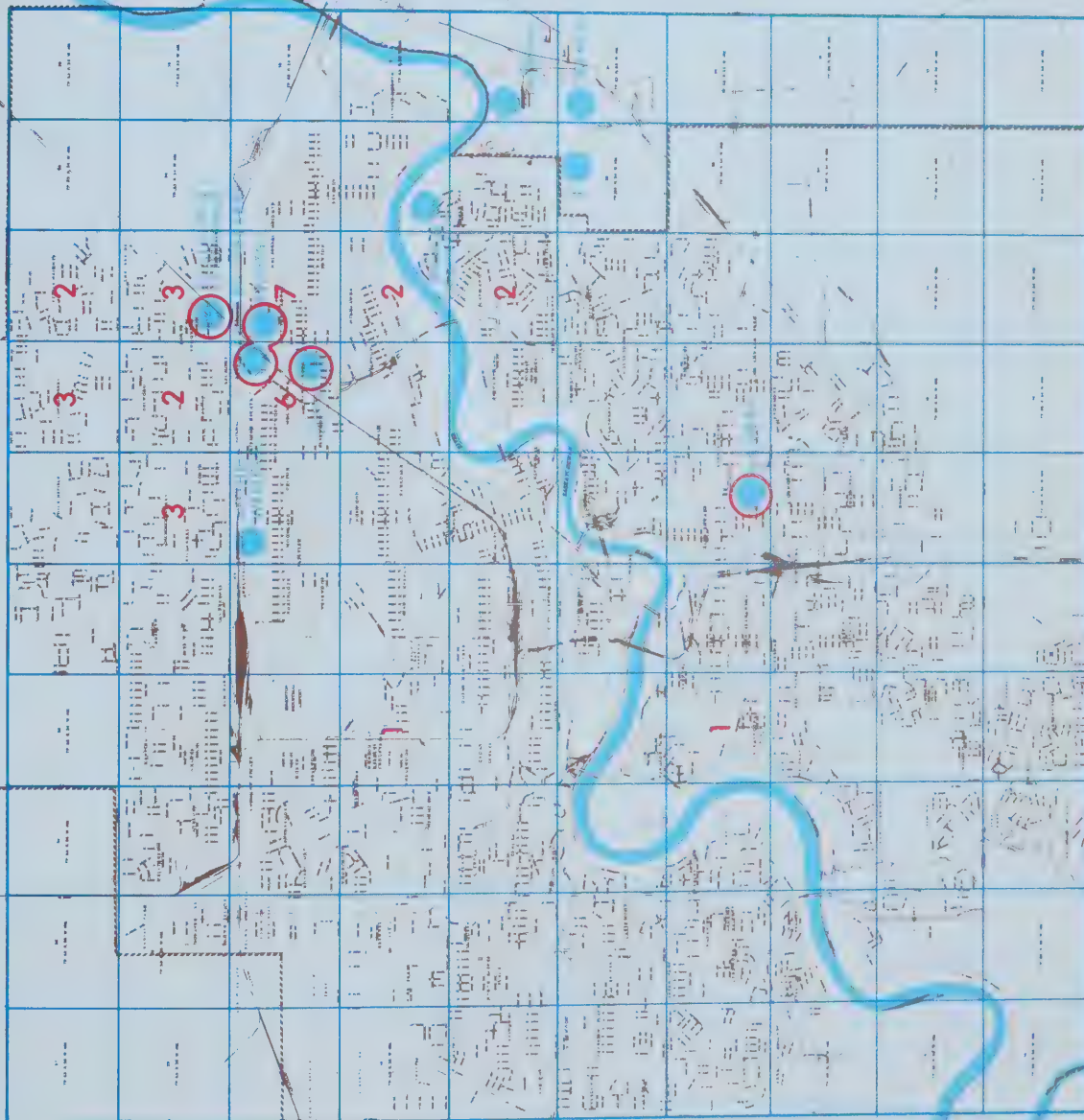
FIGURE 10





# COMPLAINTS OF SPECIFIC ODOR SOURCES MEAT PACKING PLANTS - TOTAL 32

B C D E F G H I J K





## HARDISTY SEWAGE PLANT

The Hardisty Sewage Treatment Plant was identified as a source of odor by 21 residents on 28 telephone complaints. All but two of these residents were located in grid area J-5, the other two were in the next adjacent grid area. Odors from this source appear to be extremely localized and primarily affect the residents in an area of about fifteen square blocks. The problem seems to be that the odor hangs in the low-lying area of the river valley, and does not disperse sufficiently above the valley bank under certain atmospheric conditions.

Most of the complaints identified to the Sewage Plant were observed in five time periods, primarily during the Summer. There were no observations of odor from this source before May or after October. It is possible that odors from this source occurred during upsets in the operation of the treatment plant. The worst period of complaints during August coincided with the time when the river flow was drastically reduced at the Bighorn Dam, and the Hardisty Plant had to bring new treatment facilities on-stream in a short period of time.

This source was identified by three residents during the Summer Household Survey. Two of these people were located about one-half mile from the plant, but only one observation was recorded as being very noticeable. None of these residents submitted any telephone complaints. It appears that although the odor from this source is noticeable in the higher, more distant regions from the plant above the river valley, the odor is extremely objectionable only to those people residing in the immediate vicinity.

## **ANTHES WESTERN**

Anthes Western Ltd. is the only industrial plant outside the east-end refinery/chemical area that was identified on a large number of telephone complaints. This source received 13 complaints from 6 residents. However, all but one resident resided in grid area G-3. The odor from this source appears to be very localized, and seems to bother those residents within a three or four block radius. Most complaints described the odor as being acrid, heavy smoke from the foundry stack.

## **SEWERS**

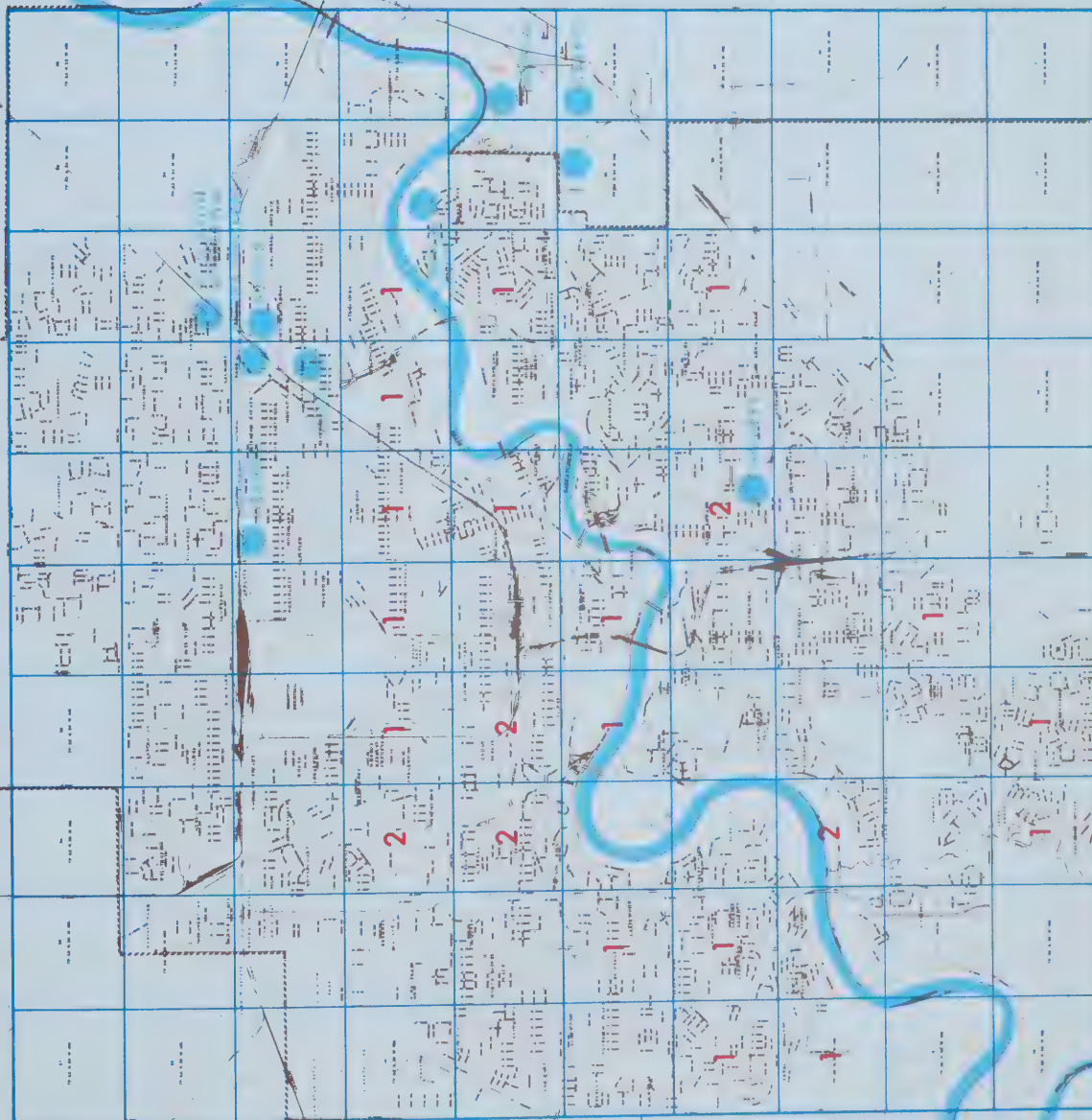
27 telephone complaints identified sanitary sewers as the source of odor. These complaints were very localized, and the sources of the odor were widely dispersed throughout the City. Figure 12 shows the distribution of telephone complaints that identified sanitary sewers as the source of odor. It is interesting to note that very few sewer odors were identified in Southeast Edmonton or the extreme Northeast, possibly because these areas are the major sources of strong complaints of other odors. In these areas it may be that sewer odors are not considered worth complaining about, or are masked by other stronger odors, or are mistakenly identified as meat processing or chemical odors.

Two sewers are specifically mentioned more than once. These were the underpass on Jasper Avenue at the C.P.R. tracks, and 122 Street by the University Farm.



# COMPLAINTS OF SPECIFIC ODOR SOURCES SEWERS - TOTAL 27

B C D E F G H I J K



(A-1)

(S-7)





## **MISCELLANEOUS ODOR SOURCES**

### **Building Products**

Building Products of Canada was identified as the source of odor on ten occurrences in the Summer Household Survey by two people. Both people live in the vicinity of the plant at the extreme east end of Gold Bar. This response contrasts with the Telephone Complaint Survey in which only three odors were specifically identified to that source.

### **City Sewage Lagoon**

The City sewage lagoon in Northeast Edmonton (located at SE¼-3-54-23-W4) was identified as the source of eight telephone complaints. However, seven of these complaints were registered by the same person.

### **Others**

The NADP Dairy was identified on three complaints concerning cheese and milk type odors.

The Bateman IGA on 76th Avenue was identified three times as the source of burning garbage.

Zeidler Plywood Corp. was identified on several occasions during the Summer Household Survey by one resident who lives a few blocks away.

Three sources of odor were commonly identified by the St. Albert Fire Hall. The nearby Safeway incinerator was most frequently mentioned. This appears to be a highly localized problem. Also mentioned frequently were the Lion's Park and the sewage lift station.

## SECTION 7

### INFLUENCE OF WEATHER, SEASON, AND TIME OF DAY

#### WEATHER

The incidence of telephone complaints was plotted for each week of the complaint survey (see Figure 13). Complaint frequency was extremely high during the initial week of the campaign, and continued at a high level throughout April and May. Very few complaints were registered in June and early July. The two month period from July 15th to September 15th, was the most intense period of complaint frequency. There were also high levels recorded in October, and in the last two weeks of December.

One interesting observation is the impact of advertising on the frequency of telephone complaints. There seems little doubt that the advertising campaign generated considerable response as exhibited on Figure 13. The frequency of complaints increased sharply after most advertising insertions in the Edmonton Journal. The intensive campaign in July and early August generated a particularly strong sustained response.

However, the complaint frequency cannot be attributed only to advertising. From July 27 to August 28, 1972, the weather was particularly hot with record low winds and thunderstorm activity. This led to a substantial increase in complaints from meat processing, sewage treatment, and sewer sources. Although an advertising campaign was carried out during the early part of this period, the frequency of complaints continued at an even higher rate for three weeks after the last advertisement. There were also instances, such as April 14th and December 5th, where the advertising had little effect on the complaint frequency. Furthermore, the incidence of complaints was high from April 16th to May 27th, although there were only two ads in those two months. Significantly, May was also above average in temperature with record low winds.

The incidence of odor occurrences in the Fire Hall Survey (where observations were made on a regular daily basis over the same period as the telephone complaints) should eliminate most of the influence of advertising. Figure 14 provides a graph of the number of odor occurrences per week from the Fire Hall Survey. This graph shows a considerable decline in the average number of odor occurrences after May. This reflects a drop in interest and commitment by the firemen once the initial enthusiasm had dissipated, rather than indicating a decrease in odor occurrences. Nevertheless, the fire hall data exhibits high periods of odor occurrences in May, August, October and December. These are the same general periods when telephone complaints peaked.

# TELEPHONE COMPLAINT INCIDENCE BY WEEK (1972)

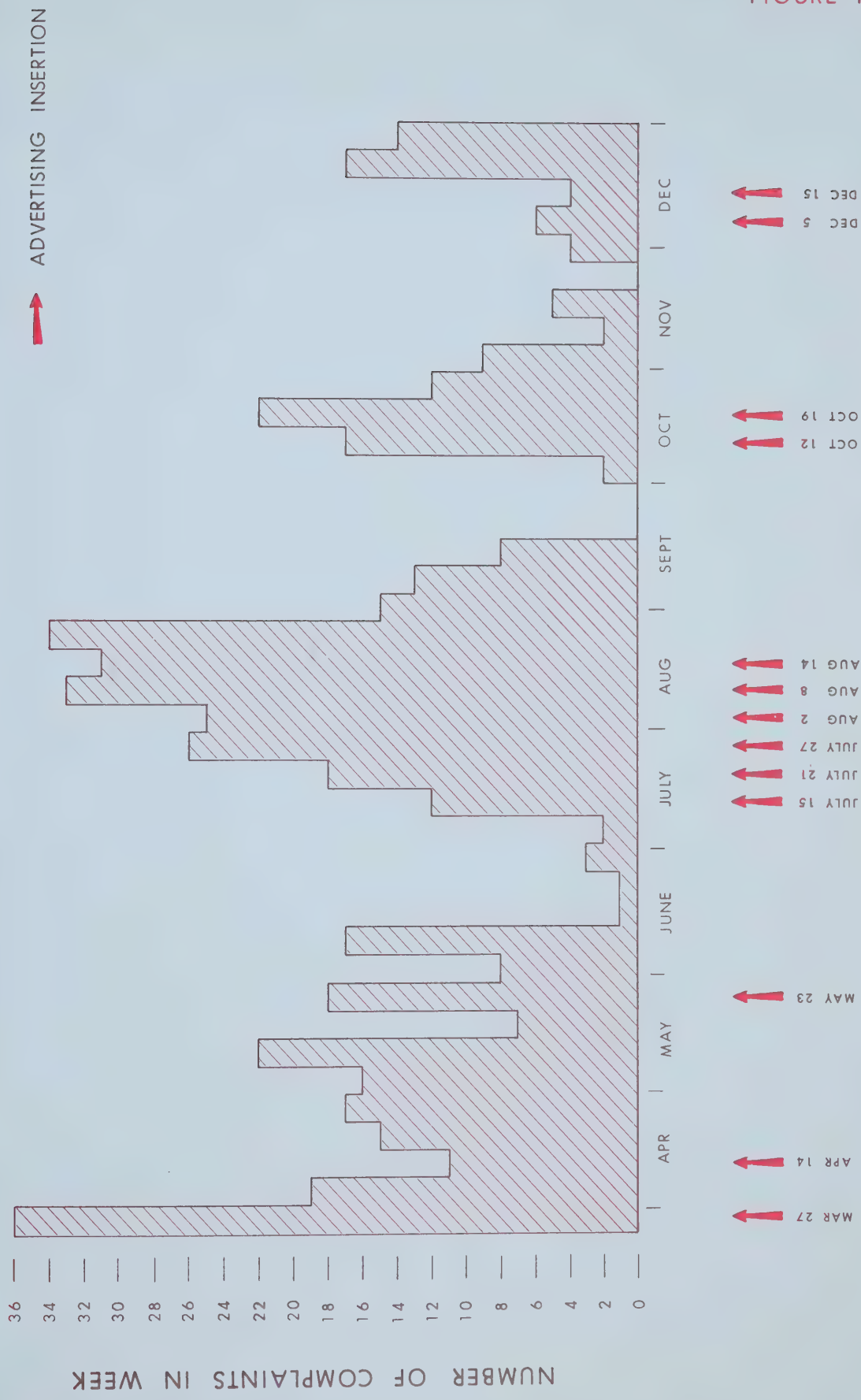


FIGURE 13



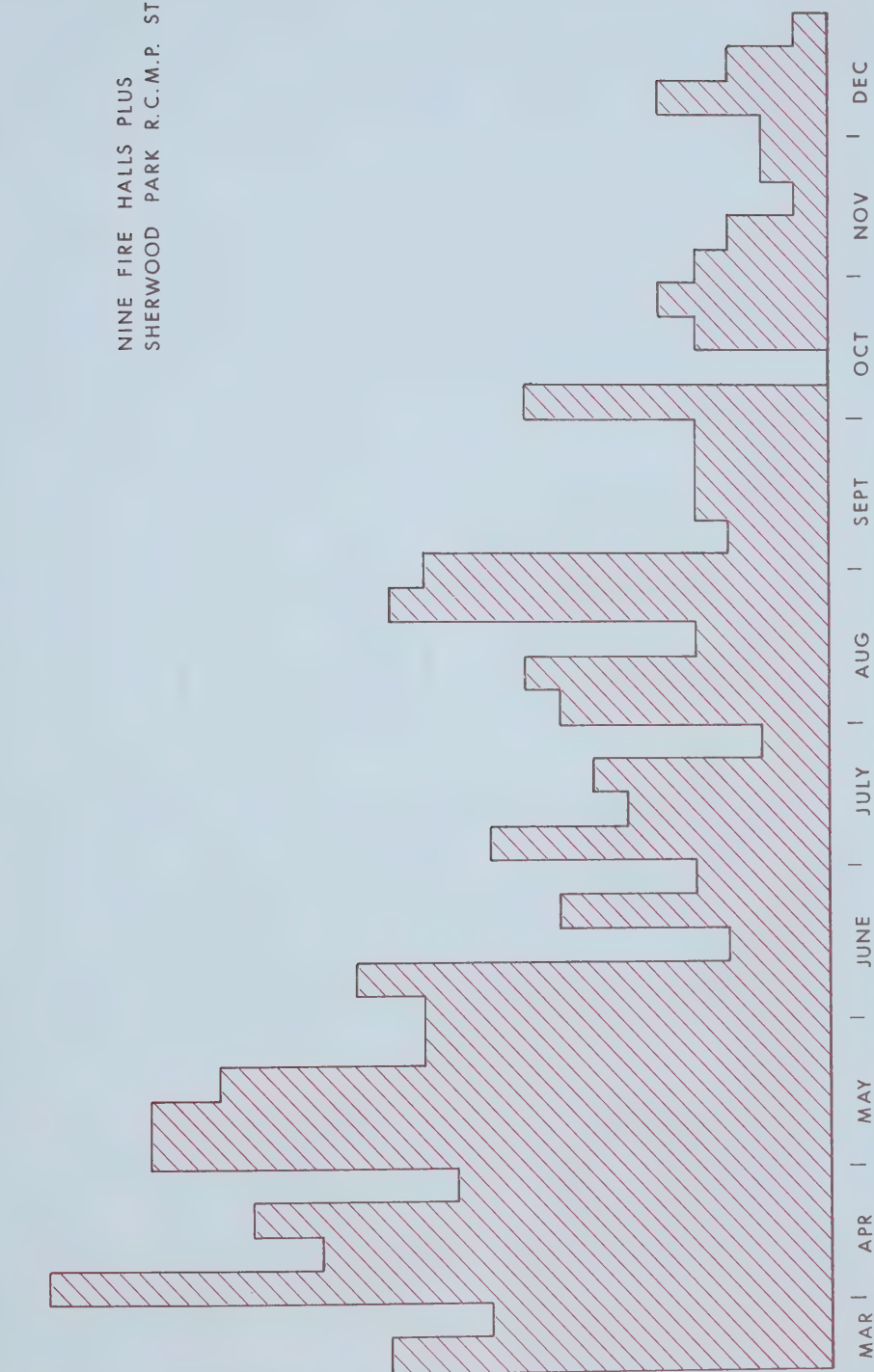


# ODOR OCCURRENCES AT FIRE HALLS BY WEEK (1972)

NUMBER OF ODOR OCCURRENCES IN WEEK

24  
22  
20  
18  
16  
14  
12  
10  
8  
6  
4  
2  
0

NINE FIRE HALLS PLUS  
SHERWOOD PARK R.C.M.P. STATION





The conclusion we make is that the periods of April 15th to May 27th, and July 27th to August 28th were particularly high odor periods, with October and December also registering shorter periods of significant odors. The first two periods were occasioned by high temperatures, record low wind velocities, and high thunderstorm activity (in August), which sharply increased the incidence of meat processing and sewage complaints in particular. The latter part of December was a period of extreme temperature inversion.

## CORRELATION WITH AIR QUALITY INDEX

Table 12 lists the days on which the air quality index as calculated by the Department of the Environment peaked at higher than 25. An index reading greater than 25 indicates some degree of air pollution. The periods of high air quality index and temperature inversion coincided to a great extent with the periods of extremely high frequency of telephone complaints.

There were six prolonged periods of high air quality index in 1972:

|           |         |
|-----------|---------|
| August    | 21 - 26 |
| September | 8 - 12  |
| November  | 20 - 23 |
| December  | 12 - 15 |
| December  | 18 - 20 |
| December  | 27 - 29 |

Three of these periods were also the highest periods of telephone complaints. December 20th, which had the record highest air quality index of 73, registered 14 telephone complaints in 24 hours. Similarly, December 27th - 28th had 11 complaints over a 24 hour period. The week of August 20th - 26th registered the highest weekly number of telephone complaints (other than the first week of the survey when publicity was at its peak). This was the longest prolonged period of high air quality index accompanied by extremely light winds and high temperature (August 26th was the hottest day of the year). All other periods of high telephone complaint frequency were associated with advertising insertions.

Three of the periods of prolonged high air quality index were not periods of high telephone complaints, but each was accompanied by favourable wind conditions. During September 8th - 12th, the winds were variable and primarily from the northerly or westerly direction which carries most odors away from the City. Likewise, November 20th - 23rd and December 12th - 15th were characterized by southwesterly to south-southwesterly winds, and elicited almost no telephone response. Again, these winds are most favorable in carrying odors away from the City.

**TABLE 12**  
**DAYS WHEN AIR QUALITY INDEX EXCEEDED 25**

| Date         | Air Quality Index* | Comments                                       |
|--------------|--------------------|------------------------------------------------|
| March 30     | 26                 |                                                |
| August 13    | 33                 |                                                |
| August 15    | 26                 |                                                |
| August 21    | 52                 | 34 Complaints in one week<br>Very light winds  |
| August 22    | 49                 |                                                |
| August 23    | 34                 |                                                |
| August 25    | 39                 |                                                |
| August 26    | 33                 |                                                |
| August 28    | 32                 |                                                |
| August 31    | 29                 |                                                |
| September 8  | 35                 | Winds W to NW                                  |
| September 11 | 41                 |                                                |
| September 12 | 28                 |                                                |
| October 4    | 26                 |                                                |
| October 5    | 35                 |                                                |
| October 13   | 35                 |                                                |
| October 19   | 31                 |                                                |
| October 31   | 34                 |                                                |
| November 1   | 31                 |                                                |
| November 8   | 30                 |                                                |
| November 20  | 26                 | Winds SSW                                      |
| November 21  | 29                 |                                                |
| November 22  | 28                 |                                                |
| November 23  | 56                 |                                                |
| December 8   | 59                 |                                                |
| December 12  | 32                 | Winds SW to SSW                                |
| December 13  | 58                 |                                                |
| December 14  | 32                 |                                                |
| December 15  | 51                 |                                                |
| December 18  | 50                 | 14 Complaints in 24 hours<br>on December 20th  |
| December 19  | 38                 |                                                |
| December 20  | 73                 |                                                |
| December 27  | 47                 | 11 Complaints in 24 hours<br>on December 27–28 |
| December 28  | 43                 |                                                |
| December 29  | 41                 |                                                |

\*Air Quality Index as compiled by the Department of the Environment.

## SEASON

The results of the Telephone Complaint Survey show that the frequency of odor occurrences peaked in July and August, and was very low in November and early December. These periods coincide with the times of the two Household Odor Occurrence Surveys. This brings into question whether the results of the Household Survey are completely valid as a seasonal comparison, or were affected more by climatic conditions than season.

Certainly, the Household Survey shows a distinct variation in odor occurrence between the Summer and Winter periods chosen. The average frequency of odor occurrences was 13% in Summer and 9% in Winter. However, the Fire Hall Survey also shows a decided drop in odor occurrences in Winter as opposed to Summer. These results would not be affected to the same degree by weather or climatic conditions, except to the extent that certain climatic conditions are more prevalent in certain seasons (e.g. heat, inversions). The Public Opinion Poll also confirmed that Edmonton residents consider odors to be more serious in Summer.

Season does seem to have a remarkable influence on the type of odors that are observed. For example, meat processing odors constituted 32% of all telephone complaints received between April and August, but only 7% of the telephone complaints from September to December. There were no meat processing complaints after October 24th. Similarly, most of the complaints about the Hardisty Sewage Treatment Plant were made in the late Spring and in the Summer months. In fact, 52% of all these complaints occurred in August.

The conclusions we draw from the seasonal odor analysis are:

- a) Odor occurrences are more commonly observed in Summer than at any other time of the year. There is an increased awareness of odor conditions during the Summer, probably due in part to the temperature, and to the fact that people are more often outdoors or have windows open.
- b) The most significant factor leading to greater Summer odors appears to be the marked increase in the number of complaints about meat processing and sewage treatment plant odors. As a percentage of odor occurrences, chemical odor increased in Winter, but the actual number of chemical occurrences declined from the Summer months.



## WIND DIRECTION

The prevailing wind in Edmonton comes from the South as shown on Figure 15. This gives rise to numerous complaints in Northeast Edmonton from meat processing and chemical odors. The next most prevalent wind direction is west-northwest to northwest. These winds cause little problem except in Sherwood Park, because the majority of odor sources are in the northeast and east side of the City.

There are numerous complaints about the petroleum and chemical plants from areas southwest and west of the plants such as in Hardisty, Gold Bar and Beverly. Yet the winds from the northeast to southeast quadrants are the least prevalent of all Edmonton area winds. Unfortunately, easterly and northeasterly winds frequently appear to be associated with conditions of temperature inversion, and this phenomenon probably produces the large number of odor occurrences associated with these infrequent winds.

## TIME OF DAY

The results of the Odor Study are inconclusive as to the effect that time of day has on the frequency of odor occurrences. However, the results do indicate that awareness of odors is greatest in the late afternoon and evening. Table 13 shows the relative frequency of odor occurrences in each survey by time of day.

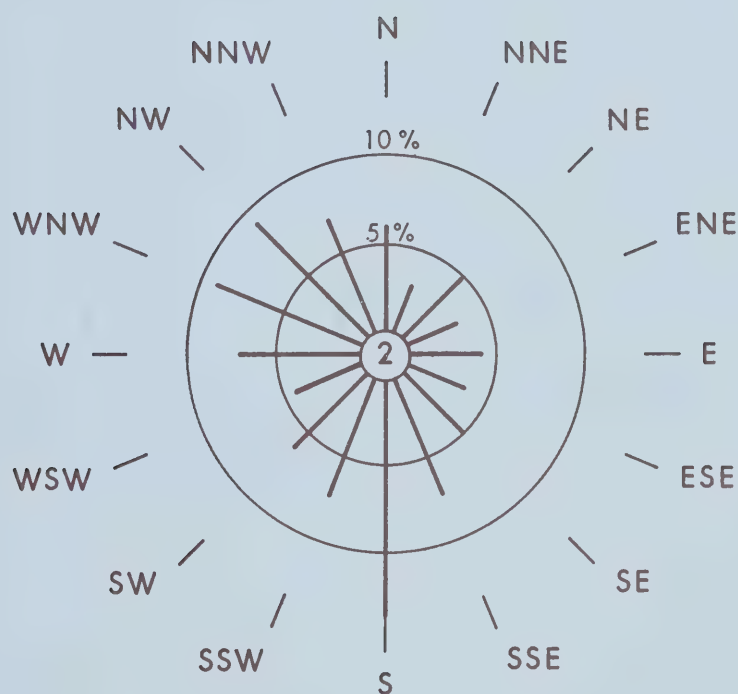
**TABLE 13**

### INFLUENCE OF TIME OF DAY ON

### RELATIVE FREQUENCY ON ODOR OCCURRENCES

|                      | Morning<br>4 AM to 12 AM | Afternoon/Evening<br>12 AM to 8 PM | Night<br>8 PM to 4 AM |
|----------------------|--------------------------|------------------------------------|-----------------------|
| Telephone Complaints | 21%                      | 40%                                | 39%                   |
| Household Survey     | 33%                      | 37%                                | 30%                   |
| Fire Hall Survey     | 41%                      | 31%                                | 28%                   |

# ANNUAL PERCENTAGE FREQUENCY OF WIND EDMONTON INDUSTRIAL AIRPORT (1955-1966)



% CALM SHOWN IN  
INNER CIRCLE



The greatest number of telephone complaints were received in the eight hour period between 4 p.m. and midnight, with only 21% of complaints being in the morning period. In contrast, the frequency of odors observed during the Household Survey show a much more even distribution of odor occurrences, again with the afternoon/evening period having the greatest number. These results agree with those of the Public Opinion Survey which indicated that odors were most serious during the evening. However, the opposite observation was noted in the Fire Hall Survey, in which 41% of all odor occurrences were observed in the morning.

The conclusions we draw from these results are as follows:

- a) Time of day does not have as much influence on the frequency of odor occurrences as does the weather or time of year.
- b) It is probably the awareness of odor rather than the incidence of odor occurrence that is time dependent. Odors clearly have a more serious effect on people in the late afternoon or early evening, as evidenced by the large number of telephone complaints (which tend to be the strong odor occurrences) during that time period. This is likely because people generally complained about odors at their residence and were much less critical of odors observed at their work or during travel. Since most people are at home in the late afternoon and evening, and often are engaged in relaxing or social activities in those times, their odor awareness seems to increase.
- c) The fire hall results are likely biased by human behavior in the working environment. There was possibly more diligence applied to the morning observations on the day shift than there was to the off-shift observations (particularly the midnight shift).

## SECTION 8

### ALTERNATIVE LEGISLATIVE APPROACHES

A survey was made of legislation that exists in Canada and the United States concerning the control of odor pollution. There appears to be no legislation on this continent that applies specifically to odor pollution. Where odor pollution regulations do exist, they are incorporated into the general legislation on air pollution control. In almost all cases, the odor regulations are worded in extremely general terms. Typical of the general wording of this legislation are such phrases as "no person shall discharge any material or air contaminant which tends to be offensive to the senses" or "unreasonably interferes with the enjoyment of life or property".

Where legislation against odors is specific, it is generally related to the reduction of animal matter. Four western states in the United States have regulations within their air pollution legislation which prohibit the operation of any equipment for the reduction of animal matter unless all gases are incinerated at temperatures of not less than 1200 degrees for not less than 0.3 seconds, or are processed in a manner determined to be equally efficient.

The State of Nevada has legislation which specifies odor pollution in terms of two measureable tests. In one test, the Control Officer is empowered to investigate an odor when 30% of a sample of people exposed to the odor believe it to be objectionable. In the other test, a violation occurs if the Control Officer is able to detect an odor in two measurements made within one hour where the odorous air has been diluted with eight or more volumes of odor-free air.

In most air pollution legislation, the emission of odors is controlled only to the extent that specific odor producing air pollutants are regulated. For example, many regulations limit the concentration of sulphur dioxide, hydrogen sulphide, and oxides of nitrogen, but odor itself is controlled only to the extent that these concentrations are below the odor threshold.

Several legislative approaches could be considered by the Government to reduce the occurrence of odors or to limit the adverse effects of odorous emissions. Such legislation should be written in quantitative terms as much as possible, or in the form of standardized repeatable measurement techniques. Some examples worth consideration are:

1. Enforce the regulation of efficient incineration or scrubbing of gases in meat processing operations. Incineration can be defined in terms of a minimum temperature for a minimum length of time. Scrubbing efficiency may be determined by the measurement of organic content of the scrubbed gases, or by a standardized odor evaluation test using an odor panel under specific conditions.



2. Enforce the efficient scrubbing of foundry emissions. The technical capability to do this exists, although experience in the United States has shown that the cost of these emission control facilities can make the foundry operation unprofitable in the case of small marginal foundries.
3. Abolish the operation of local garbage incinerators, or strictly regulate emissions from these sources by means of specified physical measurement of smoke, particulate matter, and odor.
4. Establish regulations concerning ambient air concentrations of those odorous chemical pollutants that can be identified and measured by routine analysis, such that the allowable ground level concentrations of these chemicals are below the odor threshold.
5. Establish a provincial odor panel using standardized sampling and odor observation techniques to regularly sample odors from common sources of odor and in response to citizen complaints. Violations could be defined in terms of the percent of the panel which observes an odor in the sample when the sample has been diluted a given number of times with odor-free air.
6. Restrict the building of new plants to a specified minimum distance away from existing housing. The results of the Odor Study indicate that refinery and chemical plant odors are usually confined within two miles of the source, and that meat processing and sewage plant odors are generally restricted to one mile from the source.

This type of legislation should not be used as a substitute for legislative control of odor emissions, but it does seem prudent not to aggravate the situation by allowing plants to locate in areas where even the inevitable minor plant upsets will produce noticeable odors in residential areas.

It should be noted that some meat processing plants have installed odor abatement facilities recently. The areas around these plants should be surveyed in the near future to determine whether the abatement facilities have eliminated or significantly reduced the occurrence of objectionable odors, in which case restrictions against the location of meat packing plants might be relaxed.

7. At the same time that restrictions are placed on plant locations, legislation should restrict the construction of new residential housing to the same minimum distance from existing plants.



# APPENDICES

Computer List of  
Telephone Complaints  
by Grid Area

LIST OF TELEPHONE COMPLAINTS BY GRID AREA

| CO-ORD | ADDRESS | COMPLAINT<br>NUMBER | CONV<br>CO-ORD | DIST<br>AREA | DATE<br>DMY | TIME     | TYPE | OTHER | STRENGTH | SOURCE          | RECD<br>WIND | MET<br>WIND | MET<br>SPEED |
|--------|---------|---------------------|----------------|--------------|-------------|----------|------|-------|----------|-----------------|--------------|-------------|--------------|
| F 1    |         | 44                  | 5              | 3            | 3           | 5/ 4/72  | 2    | 1     | 3        | CHEMCELL        | E            | SE          | 16           |
| G 1    |         | 93                  | 6              | 3            | 1           | 27/ 4/72 | 2    | 4     | 5        | CHEMICAL PLANT  | E            | S           | 14           |
| G 1    |         | 290                 | 6              | 3            | 1           | 8/ 8/72  | 2    | 10    | 3        | FARM            | C            | C           | 0            |
| H 1    |         | 5                   | 7              | 4            | 1           | 27/ 3/72 | 3    | 6     | 3        | PACKING PLANT   | SE           | SSE         | 2            |
| H 1    |         | 57                  | 7              | 4            | 1           | 8/ 4/72  | 3    | 5     | 3        |                 | NE           | NE          | 7            |
| H 1    |         | 84                  | 7              | 4            | 1           | 23/ 4/72 | 2    | 4     | 3        |                 | SE           | ENE         | 11           |
| H 1    |         | 94                  | 7              | 4            | 1           | 27/ 4/72 | 2    | 4     | 5        | CHEMCELL        | SE           | S           | 14           |
| H 1    |         | 96                  | 7              | 4            | 1           | 27/ 4/72 | 2    | 4     | 5        |                 | SE           | S           | 14           |
| H 1    |         | 171                 | 7              | 4            | 1           | 1/ 6/72  | 1    | 6     | 4        |                 | NNW          | NNW         | 15           |
| H 1    |         | 352                 | 7              | 4            | 1           | 21/ 8/72 | 3    | 10    | 3        | CHEMICAL ROW    | ESE          | S           | 12           |
| H 1    |         | 368                 | 7              | 4            | 1           | 24/ 8/72 | 2    | 6     | 3        | PACKING PLANT   | SE           | S           | 8            |
| H 1    |         | 380                 | 7              | 4            | 1           | 26/ 8/72 | 2    | 10    | 3        |                 | ENE          | SE          | 6            |
| H 1    |         | 399                 | 7              | 4            | 1           | 5/ 9/72  | 2    | 4     | 3        | CHEMICAL ROW    | NE           | NE          | 17           |
| H 1    |         | 421                 | 7              | 4            | 1           | 9/10/72  | 2    | 6     | 3        | SWIFTS          | SW           | NW          | 22           |
| I 1    |         | 2                   | 8              | 4            | 1           | 27/ 3/72 | 2    | 4     | 3        | CHEMICAL PLANT  | SE           | ESE         | 7            |
| I 1    |         | 3                   | 8              | 4            | 1           | 27/ 3/72 | 2    | 6     | 3        | PACKING PLANT   | SSE          | ESE         | 7            |
| I 1    |         | 18                  | 8              | 4            | 1           | 28/ 3/72 | 3    | 10    | 4        |                 | NE           | S           | 5            |
| I 1    |         | 19                  | 8              | 4            | 1           | 28/ 3/72 | 2    | 10    | 3        | FOUL ANIMAL     | E            | NNW         | 4            |
| I 1    |         | 31                  | 8              | 4            | 1           | 29/ 3/72 | 1    | 6     | 4        | FOUL ANIMAL     | S            | S           | 6            |
| I 1    |         | 34                  | 8              | 4            | 1           | 30/ 3/72 | 2    | 6     | 4        | RENDERING PLANT | SE           | SW          | 5            |
| I 1    |         | 95                  | 8              | 4            | 1           | 27/ 4/72 | 2    | 4     | 4        | RENDERING PLANT | SE           | S           | 14           |
| I 1    |         | 105                 | 8              | 4            | 1           | 27/ 4/72 | 3    | 4     | 5        | CHEMCELL        | S            | SSE         | 14           |
| I 1    |         | 165                 | 8              | 4            | 1           | 28/ 5/72 | 3    | 4     | 3        | CHEMICAL PLANT  | E            | SE          | 11           |
| I 1    |         | 172                 | 8              | 4            | 1           | 1/ 6/72  | 3    | 4     | 3        | CHEMICAL PLANT  | E            | NNW         | 10           |
| I 1    |         | 240                 | 8              | 4            | 1           | 28/ 7/72 | 2    | 6     | 4        |                 | SE           | SSE         | 13           |
| I 1    |         | 461                 | 8              | 4            | 1           | 23/10/72 | 3    | 6     | 4        | PACKING PLANT   | C            | SSW         | 8            |
| I 1    |         | 476                 | 8              | 4            | 1           | 31/10/72 | 2    | 4     | 4        | PLANT           | C            | WSW         | 6            |
| J 1    |         | 185                 | 9              | 5            | 1           | 9/ 6/72  | 3    | 4     | 3        | REFINERY        | SE           | SE          | 11           |
| K 1    |         | 275                 | 10             | 5            | 1           | 3/ 8/72  | 2    | 5     | 3        | SEWAGE LAGOON   | SE           | NW          | 5            |
| K 1    |         | 289                 | 10             | 5            | 1           | 8/ 8/72  | 3    | 5     | 5        | SEWAGE LAGOON   | C            | WSW         | 14           |
| K 1    |         | 360                 | 10             | 5            | 1           | 23/ 8/72 | 3    | 5     | 4        | SEWAGE LAGOON   | C            | C           | 0            |
| K 1    |         | 403                 | 10             | 5            | 1           | 7/ 9/72  | 2    | 5     | 4        | SEWAGE LAGOON   | SSW          | SSE         | 4            |
| K 1    |         | 404                 | 10             | 5            | 1           | 7/ 9/72  | 3    | 5     | 4        | SEWAGE PLANT    | C            | SSE         | 6            |
| K 1    |         | 441                 | 10             | 5            | 1           | 16/10/72 | 3    | 5     | 4        | CITY LAGOON     | SE           | ESE         | 11           |
| K 1    |         | 442                 | 10             | 5            | 1           | 17/10/72 | 2    | 5     | 3        | CITY LAGOON     | SE           | SE          | 8            |
| K 1    |         | 467                 | 10             | 5            | 1           | 27/10/72 | 2    | 5     | 3        | CITY LAGOON     | SE           | SSE         | 12           |
| F 2    |         | 192                 | 14             | 2            | 3           | 22/ 6/72 | 1    | 10    | 4        | DUSTY           | SE           | S           | 5            |



LIST OF TELEPHONE COMPLAINTS BY GRID AREA

| CO-ORD | ADDRESS | COMPLAINT<br>NUMBER | CONV<br>CO-ORD | DIST | ARFA | DATE<br>DMY | TIME | TYPF | OTHER            | STRENGTH | SOURCE          | RECD<br>WIND | MET<br>WIND | MET<br>SPEED |
|--------|---------|---------------------|----------------|------|------|-------------|------|------|------------------|----------|-----------------|--------------|-------------|--------------|
| F 2    |         | 204                 | 14             | 2    | 3    | 15/ 7/72    | 2    | 10   | BURNING RUBBER   | 3        | SAFEWAY         | N            | N           | 14           |
| F 2    |         | 248                 | 14             | 2    | 3    | 28/ 7/72    | 2    | 10   | SICK SWEET       | 3        |                 | C            | SSE         | 13           |
| F 2    |         | 252                 | 14             | 2    | 3    | 28/ 7/72    | 2    | 10   | UNKNOWN          | 3        | CALDER YARDS    | SE           | SSE         | 13           |
| F 2    |         | 336                 | 15             | 3    | 3    | 17/ 8/72    | 3    | 10   | GAS              | 4        |                 | C            | F           | 16           |
| G 2    |         | 33                  | 16             | 3    | 1    | 29/ 3/72    | 2    | 10   | INDUSTRIAL WASTE | 4        | PLANT           |              | SSE         | 8            |
| G 2    |         | 40                  | 16             | 3    | 1    | 4/ 4/72     | 2    | 4    |                  | 5        | ANTHES WESTERN  | S            | SSE         | 18           |
| G 2    |         | 86                  | 16             | 3    | 1    | 24/ 4/72    | 3    | 10   |                  | 3        | PACKING PLANT   | SE           | SSW         | 8            |
| G 2    |         | 119                 | 16             | 3    | 1    | 8/ 5/72     | 2    | 10   | SMOKE            | 4        | ANTHES WESTERN  | S            | SE          | 8            |
| G 2    |         | 138                 | 16             | 3    | 1    | 12/ 5/72    | 3    | 6    |                  | 3        | PACKING PLANT   | C            | S           | 14           |
| G 2    |         | 139                 | 16             | 3    | 1    | 12/ 5/72    | 3    | 6    |                  | 3        | PACKING PLANT   | E            | S           | 14           |
| G 2    |         | 222                 | 16             | 3    | 1    | 21/ 7/72    | 2    | 4    |                  | 3        | ANTHES WESTERN  |              | SSW         | 7            |
| G 2    |         | 480                 | 16             | 3    | 1    | 8/ 5/72     | 2    | 4    |                  | 5        | ANTHES WESTERN  | SW           | SE          | 8            |
| H 2    |         | 218                 | 17             | 4    | 1    | 19/ 7/72    | 3    | 6    |                  | 3        | PACKING PLANT   |              | WNW         | 9            |
| H 2    |         | 242                 | 17             | 4    | 1    | 27/ 7/72    | 2    | 6    |                  | 3        | EDM RENDERING   | NE           | S           | 12           |
| H 2    |         | 265                 | 17             | 4    | 1    | 1/ 8/72     | 2    | 6    |                  | 4        | EDM RENDERING   | E            | N           | 10           |
| H 2    |         | 333                 | 17             | 4    | 1    | 17/ 8/72    | 2    | 6    |                  | 3        | RENDERING PLANT | SE           | S           | 13           |
| H 2    |         | 334                 | 17             | 4    | 1    | 17/ 8/72    | 2    | 6    |                  | 4        | PACKING PLANT   | SSE          | S           | 13           |
| I 2    |         | 6                   | 18             | 4    | 1    | 27/ 3/72    | 3    | 6    |                  | 3        | TANNERY         | SE           | SSE         | 2            |
| I 2    |         | 7                   | 18             | 4    | 1    | 27/ 3/72    | 3    | 6    |                  | 3        | TANNERY         | SE           | SSE         | 2            |
| I 2    |         | 9                   | 18             | 4    | 1    | 27/ 3/72    | 3    | 6    |                  | 3        | RENDERING PLANT | S            | SSE         | 2            |
| I 2    |         | 26                  | 18             | 4    | 1    | 28/ 3/72    | 3    | 6    |                  | 4        | RENDERING PLANT | SW           | S           | 5            |
| I 2    |         | 64                  | 18             | 4    | 1    | 12/ 4/72    | 1    | 6    |                  | 5        | RENDERING PLANT |              | NNW         | 6            |
| I 2    |         | 75                  | 18             | 4    | 1    | 19/ 4/72    | 3    | 10   | SKUNK            | 3        | PLANT           | C            | NNW         | 17           |
| I 2    |         | 87                  | 18             | 4    | 1    | 23/ 4/72    | 1    | 6    |                  | 3        | STOCK YARDS     | SE           | ESE         | 3            |
| I 2    |         | 88                  | 18             | 4    | 1    | 23/ 4/72    | 3    | 6    |                  | 3        | PACKING PLANT   | SE           | SE          | 18           |
| I 2    |         | 91                  | 18             | 4    | 1    | 27/ 4/72    | 2    | 6    |                  | 3        | RENDERING PLANT | SE           | S           | 14           |
| I 2    |         | 97                  | 18             | 4    | 1    | 27/ 4/72    | 2    | 6    |                  | 5        | TANNERY         | SE           | S           | 14           |
| I 2    |         | 120                 | 18             | 4    | 1    | 8/ 5/72     | 3    | 6    |                  | 5        |                 |              | S           | 6            |
| I 2    |         | 123                 | 18             | 4    | 1    | 9/ 5/72     | 1    | 4    |                  | 4        | CHEMICAL PLANT  |              | SE          | 3            |
| I 2    |         | 128                 | 18             | 4    | 1    | 9/ 5/72     | 3    | 6    |                  | 5        | RENDERING PLANT | SE           | S           | 5            |
| I 2    |         | 129                 | 18             | 4    | 1    | 9/ 5/72     | 3    | 6    |                  | 5        | TANNERY         | C            | S           | 5            |
| I 2    |         | 130                 | 18             | 4    | 1    | 9/ 5/72     | 3    | 6    |                  | 5        | RENDERING PLANT | SSE          | S           | 5            |
| I 2    |         | 133                 | 18             | 4    | 1    | 11/ 5/72    | 3    | 6    |                  | 4        | RENDERING PLANT | S            | SSW         | 8            |
| I 2    |         | 194                 | 18             | 4    | 1    | 27/ 6/72    | 2    | 6    |                  | 5        | PACKING PLANT   | NW           | SSW         | 4            |
| I 2    |         | 239                 | 18             | 4    | 1    | 27/ 7/72    | 2    | 6    |                  | 4        | RENDERING PLANT | SE           | S           | 12           |
| I 2    |         | 246                 | 18             | 4    | 1    | 27/ 7/72    | 3    | 6    |                  | 4        | RENDERING PLANT | SW           | S           | 7            |
| I 2    |         | 251                 | 18             | 4    | 1    | 28/ 7/72    | 2    | 6    |                  | 3        | EDM RENDERING   | SE           | SSE         | 13           |
| I 2    |         | 257                 | 18             | 4    | 1    | 31/ 7/72    | 2    | 6    |                  | 5        | RENDERING PLANT | W            | SSW         | 12           |
| I 2    |         | 258                 | 18             | 4    | 1    | 31/ 7/72    | 2    | 6    |                  | 5        | RENDERING PLANT | NW           | SSE         | 12           |
| I 2    |         | 263                 | 18             | 4    | 1    | 1/ 8/72     | 2    | 6    |                  | 5        | EDM RENDERING   | SE           | N           | 10           |
| I 2    |         | 277                 | 18             | 4    | 1    | 3/ 8/72     | 3    | 6    |                  | 3        | EDM RENDERING   | S            | SW          | 6            |
| I 2    |         | 282                 | 18             | 4    | 1    | 7/ 8/72     | 2    | 6    |                  | 5        | TANNERY         | SE           | W           | 10           |
| I 2    |         | 283                 | 18             | 4    | 1    | 8/ 8/72     | 2    | 6    |                  | 3        | TANNERY         | SE           | C           | 0            |

LIST OF TELEPHONE COMPLAINTS BY GRID AREA

| CO-ORD | ADDRESS | COMPLAINT<br>NUMBER | CONV<br>CO-ORD | DIST<br>ARFA | DATE<br>DMY | TIME     | TYPE | OTHER | STRENGTH | SOURCE          | PCD<br>WIND | MET<br>WIND | MET<br>SPEED |
|--------|---------|---------------------|----------------|--------------|-------------|----------|------|-------|----------|-----------------|-------------|-------------|--------------|
| I 2    |         | 294                 | 18             | 4            | 1           | 8/ 8/72  | 2    | 6     | 4        | RENDERING PLANT | SW          | C           | 0            |
| I 2    |         | 313                 | 18             | 4            | 1           | 13/ 8/72 | 3    | 6     | 5        | RENDERING PLANT | E           | ESF         | 8            |
| I 2    |         | 315                 | 18             | 4            | 1           | 14/ 8/72 | 2    | 6     | 3        | RENDERING PLANT | E           | S           | P            |
| I 2    |         | 325                 | 18             | 4            | 1           | 15/ 8/72 | 2    | 6     | 5        | RENDERING PLANT | S           | SSW         | 6            |
| I 2    |         | 330                 | 18             | 4            | 1           | 16/ 8/72 | 2    | 6     | 3        | RENDERING PLANT | E           | F           | 8            |
| I 2    |         | 332                 | 18             | 4            | 1           | 17/ 8/72 | 2    | 6     | 3        | EDM RENDERING   | S           | S           | 13           |
| I 2    |         | 337                 | 18             | 4            | 1           | 18/ 8/72 | 3    | 6     | 3        | RENDERING PLANT | S           | S           | 4            |
| I 2    |         | 339                 | 18             | 4            | 1           | 19/ 8/72 | 1    | 6     | 3        | PACKING PLANT   | S           | NW          | 3            |
| I 2    |         | 340                 | 18             | 4            | 1           | 19/ 8/72 | 1    | 6     | 3        | PACKING PLANT   | SE          | NW          | 3            |
| I 2    |         | 348                 | 18             | 4            | 1           | 21/ 8/72 | 2    | 6     | 4        | TANNERY         | E           | S           | 14           |
| I 2    |         | 349                 | 18             | 4            | 1           | 21/ 8/72 | 2    | 10    | 5        | UNKNOWN         | SE          | S           | 14           |
| I 2    |         | 350                 | 18             | 4            | 1           | 21/ 8/72 | 2    | 6     | 4        | EDM RENDERING   | S           | S           | 14           |
| I 2    |         | 351                 | 18             | 4            | 1           | 21/ 8/72 | 2    | 6     | 4        | EDM RENDERING   | S           | S           | 14           |
| I 2    |         | 353                 | 18             | 4            | 1           | 21/ 8/72 | 3    | 6     | 3        | RENDERING PLANT | N           | S           | 12           |
| I 2    |         | 385                 | 18             | 4            | 1           | 28/ 8/72 | 2    | 6     | 3        | EDM RENDERING   | SE          | ESE         | 7            |
| D 3    |         | 401                 | 23             | 7            | 3           | 6/ 9/72  | 2    | 2     | 3        |                 | N           | N           | 6            |
| F 3    |         | 304                 | 24             | 7            | 3           | 10/ 8/72 | 2    | 10    | 4        | OIL             |             | ENE         | 11           |
| F 3    |         | 67                  | 25             | 8            | 3           | 15/ 4/72 | 2    | 10    | 3        | SMOKE           | NE          | W           | 24           |
| G 3    |         | 135                 | 26             | 8            | 1           | 11/ 5/72 | 3    | 10    | 3        | UNKNOWN         | N           | SSW         | 8            |
| G 3    |         | 136                 | 26             | 8            | 1           | 12/ 5/72 | 2    | 10    | 3        | SMOKE           | NW          | NW          | 5            |
| G 3    |         | 249                 | 26             | 8            | 1           | 28/ 7/72 | 2    | 10    | 3        | SMOKE           | E           | SSC         | 13           |
| G 3    |         | 270                 | 26             | 8            | 1           | 27/ 8/72 | 3    | 10    | 3        | BARBEQUE FLUID  |             | SSW         | 5            |
| G 3    |         | 279                 | 26             | 8            | 1           | 4/ 8/72  | 2    | 10    | 3        | SMOKE           | E           | F           | 15           |
| G 3    |         | 296                 | 26             | 8            | 1           | 8/ 8/72  | 2    | 10    | 3        | SMOKE           | NE          | C           | 0            |
| G 3    |         | 301                 | 26             | 8            | 1           | 10/ 8/72 | 2    | 10    | 3        | SMOKE           | NE          | FNE         | 11           |
| G 3    |         | 309                 | 26             | 8            | 1           | 11/ 8/72 | 1    | 10    | 3        | SMOKE           | NE          | N           | 8            |
| G 3    |         | 377                 | 26             | 8            | 1           | 25/ 8/72 | 3    | 10    | 3        | SKUNK           | E           | C           | 0            |
| G 3    |         | 381                 | 26             | 8            | 1           | 27/ 8/72 | 3    | 10    | 3        | SKUNK           |             | FSF         | 5            |
| G 3    |         | 391                 | 26             | 8            | 1           | 30/ 8/72 | 2    | 10    | 3        | UNKNOWN         | NW          | NW          | 9            |
| G 3    |         | 392                 | 26             | 8            | 1           | 30/ 8/72 | 2    | 10    | 3        | BURNING RUBBER  | NE          | N           | 6            |
| G 3    |         | 400                 | 26             | 8            | 1           | 6/ 5/72  | 2    | 4     | 4        |                 | N           | SSC         | 15           |
| G 7    |         | 443                 | 66             | 18           | 2           | 17/10/72 | 3    | 6     | 3        | GAINERS         |             | F           | 8            |
| G 7    |         | 458                 | 66             | 18           | 2           | 21/10/72 | 2    | 6     | 5        | GAINERS         | E           | S           | 8            |
| G 7    |         | 459                 | 66             | 18           | 2           | 21/10/72 | 3    | 6     | 3        | GAINERS         |             |             |              |
| H 3    |         | 131                 | 27             | 9            | 1           | 11/ 5/72 | 1    | 6     | 3        | PACKING PLANT   |             | S           | 2            |
| H 3    |         | 140                 | 27             | 9            | 1           | 19/ 5/72 | 1    | 10    | 5        |                 | E           | SSW         | 8            |
| H 3    |         | 213                 | 27             | 9            | 1           | 17/ 7/72 | 2    | 6     | 4        | PACKING PLANT   | N           | N           | 17           |
| H 3    |         | 214                 | 27             | 9            | 1           | 17/ 7/72 | 2    | 6     | 3        | PACKING PLANT   | N           | N           | 17           |
| H 3    |         | 371                 | 27             | 9            | 1           | 24/ 8/72 | 3    | 6     | 5        | PACKING PLANT   | C           | SW          | 5            |
| H 3    |         | 405                 | 27             | 9            | 1           | 8/ 9/72  | 1    | 6     | 3        | SWIFTS          | E           | SP          | 9            |
| H 3    |         | 424                 | 27             | 9            | 1           | 12/10/72 | 2    | 6     | 3        | BURNS           | NW          | NW          | 17           |

LIST OF TELEPHONE COMPLAINTS BY GRID AREA

| CO-ORD | ADDRESS | COMPLAINT<br>NUMBER | CONV<br>CU-ORD | DIST | AREA | DATE<br>DMY | TIME | TYPE | OTHER   | STRENGTH | SOURCE          | RECD<br>WIND | MT<br>WIND | MT<br>SPEED |
|--------|---------|---------------------|----------------|------|------|-------------|------|------|---------|----------|-----------------|--------------|------------|-------------|
| I 3    |         | 10                  | 28             | 9    | 1    | 28/ 3/72    | 1    | 6    |         | 4        | BURNS           | N            | C          | 0           |
| I 3    |         | 48                  | 28             | 9    | 1    | 6/ 4/72     | 2    | 5    |         | 2        | TANNERY         | NW           | NW         | 14          |
| I 3    |         | 61                  | 28             | 9    | 1    | 11/ 4/72    | 2    | 6    |         | 4        | PACKING PLANT   | NW           | C          | 6           |
| I 3    |         | 68                  | 28             | 9    | 1    | 16/ 4/72    | 3    | 6    |         | 3        | STOCK YARDS     | N            | N          | 4           |
| I 3    |         | 160                 | 28             | 9    | 1    | 25/ 5/72    | 3    | 6    |         | 2        | PACKING PLANT   | NW           | NW         | 9           |
| I 3    |         | 169                 | 28             | 9    | 1    | 30/ 5/72    | 2    | 10   | MANURE  | 2        | STOCK YARDS     | C            | FSH        | 5           |
| I 3    |         | 195                 | 28             | 9    | 1    | 27/ 6/72    | 2    | 6    |         | 4        | RENDERING PLANT |              | SSW        | 9           |
| I 3    |         | 197                 | 28             | 9    | 1    | 4/ 7/72     | 1    | 10   | UNKNOWN | 5        | PACKING PLANT   | NW           | NW         | 4           |
| I 3    |         | 199                 | 28             | 9    | 1    | 10/ 7/72    | 3    | 6    |         | 3        | PACKING PLANT   |              | WNW        | 6           |
| I 3    |         | 206                 | 28             | 9    | 1    | 15/ 7/72    | 2    | 10   | UNKNOWN | 4        |                 | N            | N          | 14          |
| I 3    |         | 212                 | 28             | 9    | 1    | 17/ 7/72    | 2    | 6    |         | 3        | SWIFTS          | N            | N          | 17          |
| I 3    |         | 243                 | 28             | 9    | 1    | 27/ 7/72    | 2    | 6    |         | 4        | PACKING PLANT   | NW           | S          | 12          |
| I 3    |         | 261                 | 28             | 9    | 1    | 31/ 7/72    | 2    | 6    |         | 3        | SWIFTS          | NW           | SSF        | 12          |
| I 3    |         | 356                 | 28             | 9    | 1    | 22/ 8/72    | 2    | 6    |         | 3        | RENDERING PLANT | NW           | N          | 7           |
| J 3    |         | 14                  | 29             | 10   | 1    | 28/ 3/72    | 1    | 4    |         | 4        | CHEMICAL ROW    | E            | C          | 0           |
| J 3    |         | 121                 | 29             | 10   | 1    | 8/ 5/72     | 3    | 4    |         | 3        | CHEMCELL        | E            | S          | 6           |
| J 3    |         | 478                 | 29             | 10   | 1    | 1/11/72     | 3    | 4    |         | 4        | CHEMICAL PLANT  | NE           | SE         | 12          |
| K 3    |         | 38                  | 30             | 10   | 1    | 1/ 4/72     | 2    | 4    |         | 5        | FIRERGLAS       | ENE          | NW         | 12          |
| K 3    |         | 79                  | 30             | 10   | 1    | 19/ 4/72    | 2    | 4    |         | 4        | FIRERGLAS       | ENE          | NW         | 12          |
| K 3    |         | 80                  | 30             | 10   | 1    | 21/ 4/72    | 1    | 4    |         | 3        | FIRERGLAS       | ENE          | ENE        | 13          |
| K 3    |         | 241                 | 30             | 10   | 1    | 28/ 7/72    | 1    | 4    |         | 5        | FIRERGLAS       |              | WNW        | 8           |
| K 3    |         | 299                 | 30             | 10   | 1    | 10/ 8/72    | 1    | 4    |         | 3        | FIRERGLAS       | F            | F          | 8           |
| K 3    |         | 449                 | 30             | 10   | 1    | 19/10/72    | 3    | 4    |         | 3        | CHEMICAL PLANT  | W            | W          | 3           |
| R 4    |         | 114                 | 31             | 6    | 3    | 5/ 5/72     | 3    | 4    |         | 4        | CHEMICAL PLANT  | E            | ENE        | 5           |
| R 4    |         | 168                 | 31             | 6    | 3    | 30/ 5/72    | 3    | 4    |         | 4        | CHEMICAL PLANT  |              | FSE        | 5           |
| C 4    |         | 355                 | 32             | 6    | 3    | 22/ 8/72    | 1    | 5    |         | 3        | CITY DUMP       | N            | SW         | 5           |
| C 4    |         | 387                 | 32             | 6    | 3    | 29/ 9/72    | 1    | 5    |         | 3        |                 | NW           | NW         | 10          |
| D 4    |         | 29                  | 33             | 7    | 3    | 28/ 3/72    | 3    | 6    |         | 3        | SEWER           |              | S          | 5           |
| D 4    |         | 228                 | 33             | 7    | 3    | 29/ 7/72    | 1    | 10   | UNKNOWN | 3        | IMPERIAL OIL    | E            | NW         | 8           |
| D 4    |         | 256                 | 33             | 7    | 3    | 31/ 7/72    | 2    | 10   | RUBBER  | 3        | SEWER           | SW           | SW         | 12          |
| D 4    |         | 260                 | 33             | 7    | 3    | 2/ 8/72     | 1    | 6    |         | 3        |                 |              | SW         | 5           |
| D 4    |         | 494                 | 33             | 7    | 3    | 15/11/72    | 2    | 6    |         | 4        |                 |              |            | 6           |
| F 4    |         | 116                 | 34             | 7    | 3    | 6/ 5/72     | 3    | 1    |         | 3        | REFINERY        | F            | NW         | 4           |
| F 4    |         | 215                 | 34             | 7    | 3    | 18/ 7/72    | 1    | 5    |         | 3        |                 |              | NW         | 14          |
| F 4    |         | 386                 | 34             | 7    | 3    | 29/ 8/72    | 1    | 5    |         | 3        | CANADA PACKERS  |              | NW         | 10          |
| F 4    |         | 487                 | 34             | 7    | 3    | 13/11/72    | 1    | 5    |         | 3        | SEWER           |              | SSW        | 10          |
| F 4    |         | 41                  | 35             | 8    | 3    | 4/ 4/72     | 3    | 4    |         | 3        |                 |              | S          | 6           |

LIST OF TELEPHONE COMPLAINTS BY GRID AREA

| CO-ORD | ADDRESS | COMPLAINT<br>NUMBER | CONV<br>CO-ORD | DIST | AREA | DATE<br>DMY | TIME | TYPE | OTHER   | STRENGTH | SOURCE           | RECD<br>WIND | MET<br>WIND | MFT<br>SPEED |
|--------|---------|---------------------|----------------|------|------|-------------|------|------|---------|----------|------------------|--------------|-------------|--------------|
| F 4    |         | 154                 | 35             | 8    | 3    | 24/ 5/72    | 1    | 5    |         | 4        | SEWER            | NF           | ESF         | 4            |
| F 4    |         | 440                 | 35             | 8    | 3    | 16/10/72    | 2    | 4    |         | 3        |                  |              | F           | 13           |
| G 4    |         | 445                 | 36             | 8    | 1    | 18/10/72    | 2    | 5    |         | 5        | SEWER            | SE           | S           | 7            |
| H 4    |         | 344                 | 37             | 9    | 1    | 19/ 8/72    | 3    | 4    |         | 5        | FIBERGLAS        | NE           | NNE         | 8            |
| H 4    |         | 526                 | 37             | 9    | 1    | 22/12/72    | 3    | 5    |         | 3        | SEWER            | SE           | W           | P            |
| I 4    |         | 21                  | 38             | 9    | 1    | 28/ 3/72    | 2    | 6    |         | 3        | PACKING PLANT    | NNW          |             | 4            |
| I 4    |         | 81                  | 38             | 9    | 1    | 21/ 4/72    | 2    | 4    |         | 4        | FIBERGLAS        | NE           |             | 22           |
| I 4    |         | 152                 | 38             | 9    | 1    | 23/ 5/72    | 3    | 5    |         | 5        |                  | C            | SE          | 5            |
| I 4    |         | 173                 | 38             | 9    | 1    | 3/ 6/72     | 1    | 4    |         | 4        | CHEMICAL PLANT   | C            | SE          | 6            |
| I 4    |         | 245                 | 38             | 9    | 1    | 26/ 7/72    | 3    | 10   | UNKNOWN | 3        |                  | E            | ENE         | 7            |
| I 4    |         | 297                 | 38             | 9    | 1    | 10/ 8/72    | 1    | 1    |         | 3        | REFINERY         | F            |             | 8            |
| I 4    |         | 300                 | 38             | 9    | 1    | 10/ 8/72    | 1    | 10   | UNKNOWN | 3        |                  | F            |             | 8            |
| I 4    |         | 375                 | 38             | 9    | 1    | 26/ 8/72    | 3    | 5    |         | 3        | CITY DUMP        | S            | NNE         | 7            |
| I 4    |         | 393                 | 38             | 9    | 1    | 31/ 8/72    | 2    | 5    |         | 3        | SEWER            | C            | W           | 15           |
| I 4    |         | 429                 | 38             | 9    | 1    | 12/10/72    | 3    | 6    |         | 4        | SWIFTS           | C            | W           | 6            |
| I 4    |         | 454                 | 38             | 9    | 1    | 19/10/72    | 3    | 5    |         | 4        |                  | S            | W           | 3            |
| I 4    |         | 456                 | 39             | 9    | 1    | 19/10/72    | 3    | 5    |         | 3        |                  | C            | W           | 3            |
| J 4    |         | 39                  | 39             | 10   | 1    | 3/ 4/72     | 1    | 4    |         | 3        | REFINERY         | FSE          | NNW         | 11           |
| J 4    |         | 46                  | 39             | 10   | 1    | 5/ 4/72     | 3    | 4    |         | 4        | CHEMICAL PLANT   | NE           | W           | 3            |
| J 4    |         | 55                  | 39             | 10   | 1    | 8/ 4/72     | 3    | 4    |         | 3        | CHEMCELL         | NE           | NE          | 7            |
| J 4    |         | 271                 | 39             | 10   | 1    | 3/ 8/72     | 2    | 10   | GLUE    | 3        | CHEMICAL PLANT   | E            | NNW         | 5            |
| J 4    |         | 329                 | 39             | 10   | 1    | 16/ 8/72    | 2    | 4    |         | 3        | CIL              | NE           | F           | 8            |
| J 4    |         | 343                 | 39             | 10   | 1    | 18/ 8/72    | 3    | 4    |         | 4        | FIBERGLAS        | E            | S           | 4            |
| J 4    |         | 466                 | 39             | 10   | 1    | 26/10/72    | 2    | 3    |         | 3        | BUILDING PRODUCT | S            | N           | 9            |
| K 4    |         | 22                  | 40             | 10   | 1    | 28/ 3/72    | 3    | 1    |         | 3        | REFINERY         | SSW          | S           | 5            |
| K 4    |         | 23                  | 40             | 10   | 1    | 28/ 3/72    | 3    | 1    |         | 4        | REFINERY         | SE           | S           | 5            |
| K 4    |         | 66                  | 40             | 10   | 1    | 12/ 4/72    | 3    | 1    |         | 3        | GULF REFINERY    | N            | W           | 5            |
| K 4    |         | 92                  | 40             | 10   | 1    | 21/ 4/72    | 2    | 4    |         | 3        | GULF REFINERY    | SE           | S           | 14           |
| K 4    |         | 101                 | 40             | 10   | 1    | 30/ 4/72    | 3    | 4    |         | 5        | GULF REFINERY    | SE           | SSW         | 3            |
| K 4    |         | 141                 | 40             | 10   | 1    | 18/ 5/72    | 2    | 4    |         | 3        | CHEMICAL PLANT   | NE           | N           | 18           |
| K 4    |         | 151                 | 40             | 10   | 1    | 23/ 5/72    | 3    | 1    |         | 3        | GULF REFINERY    | SSW          | S           | 5            |
| K 4    |         | 155                 | 40             | 10   | 1    | 24/ 5/72    | 2    | 1    | GAPAGE  | 3        | REFINERY EQUIP   | S            | N           | 9            |
| K 4    |         | 188                 | 40             | 10   | 1    | 3/ 6/72     | 3    | 4    |         | 4        |                  | SE           | S           | 11           |
| K 4    |         | 193                 | 40             | 10   | 1    | 21/ 6/72    | 3    | 1    | GAPAGE  | 3        | SLURRY JUMP      | SE           | SSW         | 7            |
| K 4    |         | 281                 | 40             | 10   | 1    | 7/ 8/72     | 2    | 1    |         | 3        | CHEMICAL ROW     | C            |             | 10           |
| K 4    |         | 293                 | 40             | 10   | 1    | 8/ 8/72     | 2    | 1    |         | 3        | IMPERIAL HTL     | S            | C           | 9            |
| K 4    |         | 398                 | 40             | 10   | 1    | 4/ 9/72     | 3    | 10   | UNKNOWN | 5        | REFINERY         | SE           | F           | 7            |
| K 4    |         | 486                 | 40             | 10   | 1    | 13/11/72    | 1    | 4    |         | 3        | CHEMICAL PLANT   | E            | SSW         | 10           |
| R 5    |         | 15                  | 41             | 11   | 3    | 28/ 3/72    | 1    | 10   | UNKNOWN | 4        |                  | N            | C           | 9            |

LIST OF TELEPHONE COMPLAINTS BY GRID AREA

| CO-ORD | ADDRESS | COMPLAINT<br>NUMBER | CONV<br>CO-ORD | DIST | ARFA | DATE<br>DMY | TIME | TYPE | OTHER            | STRENGTH | SOURCE         | REC'D<br>WIND | MET<br>WIND | MET<br>SPEED |
|--------|---------|---------------------|----------------|------|------|-------------|------|------|------------------|----------|----------------|---------------|-------------|--------------|
| C 5    |         | 89                  | 42             | 11   | 3    | 26/ 4/72    | 2    | 10   | BURNING RUBBER   | 3        |                | C             | S           | 8            |
| C 5    |         | 201                 | 42             | 11   | 3    | 14/ 7/72    | 3    | 10   |                  | 3        |                | C             | WNW         | 7            |
| C 5    |         | 217                 | 42             | 11   | 3    | 19/ 7/72    | 3    | 10   | GAS              | 3        |                | NW            | WNW         | 9            |
| C 5    |         | 384                 | 42             | 11   | 3    | 28/ 8/72    | 1    | 5    |                  | 3        | GARBAGE TRUCK  |               | NE          | 4            |
|        |         |                     |                |      |      |             |      |      |                  |          |                |               |             |              |
| O 5    |         | 45                  | 43             | 12   | 3    | 5/ 4/72     | 3    | 2    |                  | 4        |                |               | W           | 3            |
| O 5    |         | 104                 | 43             | 12   | 3    | 2/ 5/72     | 3    | 4    |                  | 4        |                |               | N           | 5            |
| O 5    |         | 317                 | 43             | 12   | 3    | 14/ 8/72    | 2    | 10   | GAS              | 3        |                |               | S           | 8            |
| O 5    |         | 318                 | 43             | 12   | 3    | 14/ 8/72    | 1    | 5    |                  | 3        | SEWER          |               | C           | 0            |
| O 5    |         | 320                 | 43             | 12   | 3    | 14/ 8/72    | 3    | 6    |                  | 4        | SEWER          |               | S           | 5            |
| O 5    |         | 382                 | 43             | 12   | 3    | 28/ 8/72    | 1    | 4    |                  | 3        | CHEMCELL       | C             | NE          | 4            |
| O 5    |         | 383                 | 43             | 12   | 3    | 28/ 8/72    | 1    | 10   | GAS              | 5        | CHEMICAL PLANT |               | NF          | 4            |
|        |         |                     |                |      |      |             |      |      |                  |          |                |               |             |              |
| F 5    |         | 8                   | 44             | 12   | 3    | 27/ 3/72    | 3    | 5    |                  | 3        | SEWER          | E             | SSF         | 2            |
| F 5    |         | 143                 | 44             | 12   | 3    | 17/ 5/72    | 3    | 10   | IODINE           | 3        |                |               | NNE         | 5            |
| F 5    |         | 482                 | 44             | 12   | 3    | 3/11/72     | 3    | 10   | COOKING          | 4        | RESTAURANT     | SE            | E           | 11           |
| F 5    |         | 484                 | 44             | 12   | 3    | 5/11/72     | 1    | 5    |                  | 3        | SEWER          |               | NNE         | 12           |
|        |         |                     |                |      |      |             |      |      |                  |          |                |               |             |              |
| F 5    |         | 24                  | 45             | 13   | 3    | 28/ 3/72    | 3    | 2    |                  | 4        |                |               | S           | 5            |
| F 5    |         | 69                  | 45             | 13   | 3    | 15/ 4/72    | 2    | 10   | UNKNOWN          | 3        | NADP DAIRY     | WNW           | W           | 24           |
| F 5    |         | 191                 | 45             | 13   | 3    | 11/ 6/72    | 2    | 4    |                  | 3        | CHEMCELL       | NE            | ENI         | 15           |
| F 5    |         | 208                 | 45             | 13   | 3    | 15/ 7/72    | 2    | 10   | RESTAURANT ODORS | 5        | CARAVAN HOTEL  |               | N           | 14           |
| F 5    |         | 209                 | 45             | 13   | 3    | 15/ 7/72    | 2    | 10   | CHEAP CHEESE     | 5        | NADP DAIRY     |               | N           | 14           |
|        |         |                     |                |      |      |             |      |      |                  |          |                |               |             |              |
| G 5    |         | 163                 | 46             | 13   | 1    | 27/ 5/72    | 3    | 4    |                  | 3        | CHEMICAL PLANT | C             | S           | 10           |
| G 5    |         | 174                 | 46             | 13   | 1    | 4/ 6/72     | 3    | 5    |                  | 5        | SEWER          | C             | SE          | 2            |
|        |         |                     |                |      |      |             |      |      |                  |          |                |               |             |              |
| H 5    |         | 499                 | 47             | 14   | 2    | 6/12/72     | 2    | 10   | UNKNOWN          | 3        | NADP DAIRY     | N             | NW          | 10           |
|        |         |                     |                |      |      |             |      |      |                  |          |                |               |             |              |
| I 5    |         | 37                  | 48             | 14   | 2    | 31/ 3/72    | 2    | 8    |                  | 3        | CIL            | S             | S           | 18           |
| I 5    |         | 42                  | 48             | 14   | 2    | 4/ 4/72     | 3    | 4    |                  | 3        | CHEMCELL       |               | S           | 6            |
| I 5    |         | 65                  | 48             | 14   | 2    | 12/ 4/72    | 1    | 6    |                  | 3        | PACKING PLANT  | N             | WNW         | 6            |
| I 5    |         | 112                 | 48             | 14   | 2    | 5/ 5/72     | 3    | 4    |                  | 4        | CHEMICAL PLANT | NNE           | FWI         | 5            |
| I 5    |         | 115                 | 48             | 14   | 2    | 5/ 5/72     | 3    | 4    |                  | 4        | REFINERY       | L             | FWI         | 5            |
| I 5    |         | 126                 | 48             | 14   | 2    | 9/ 5/72     | 3    | 4    |                  | 3        | CHEMICAL PLANT | NNE           | S           | 5            |
| I 5    |         | 127                 | 48             | 14   | 2    | 9/ 5/72     | 3    | 10   |                  | 3        | CHEMICAL ROW   |               | S           | 5            |
| I 5    |         | 142                 | 48             | 14   | 2    | 18/ 5/72    | 3    | 4    |                  | 4        | CHEMCELL       | C             | WNW         | 4            |
| I 5    |         | 150                 | 48             | 14   | 2    | 23/ 5/72    | 3    | 4    |                  | 3        | CHEMICAL ROW   | E             | SE          | 5            |
| I 5    |         | 164                 | 48             | 14   | 2    | 27/ 5/72    | 3    | 4    |                  | 4        | CHEMCELL       | C             | S           | 10           |
| I 5    |         | 184                 | 48             | 14   | 2    | 9/ 6/72     | 3    | 1    |                  | 3        | CHEMCELL       | NE            | C           | 11           |
| I 5    |         | 196                 | 48             | 14   | 2    | 9/ 6/72     | 3    | 4    |                  | 3        | CHEMCELL       | NE            | SE          | 11           |
| I 5    |         | 187                 | 48             | 14   | 2    | 9/ 6/72     | 3    | 4    |                  | 4        | REFINERY       | E             | SE          | 11           |
| I 5    |         | 220                 | 48             | 14   | 2    | 21/ 7/72    | 1    | 4    |                  | 3        |                | C             | FWI         | 5            |
| I 5    |         | 223                 | 48             | 14   | 2    | 21/ 7/72    | 1    | 1    |                  | 3        | CHEMICAL ROW   |               | ENF         | 5            |
| I 5    |         | 262                 | 48             | 14   | 2    | 31/ 7/72    | 3    | 6    |                  | 4        | PACKING PLANT  | NW            | WNW         | 7            |



LIST OF TELEPHONE COMPLAINTS BY GRID AREA

| CO-ORD | ADDRESS | COMPLAINT<br>NUMBER | CONV<br>CO-ORD | DIST<br>AREA | DATE<br>DMY | TIME     | TYPE | OTHER | STRENGTH | SOURCE         | RECD<br>WIND | MET<br>WIND | MET<br>SPEED |
|--------|---------|---------------------|----------------|--------------|-------------|----------|------|-------|----------|----------------|--------------|-------------|--------------|
| I 5    |         | 272                 | 48             | 14           | 2           | 3/ 8/72  | 2    | 4     | 4        | CHEMICAL PLANT | NE           | NW          | 5            |
| I 5    |         | 274                 | 48             | 14           | 2           | 3/ 8/72  | 2    | 4     | 3        | FIBERGLAS      | E            | NW          | 5            |
| I 5    |         | 314                 | 48             | 14           | 2           | 13/ 8/72 | 2    | 5     | 4        | SEWAGE PLANT   | F            | E           | 10           |
| I 5    |         | 328                 | 48             | 14           | 2           | 15/ 8/72 | 3    | 5     | 3        | SEWAGE PLANT   |              | ESE         | 3            |
| I 5    |         | 342                 | 48             | 14           | 2           | 19/ 8/72 | 3    | 5     | 3        | SEWAGE PLANT   | C            | NNE         | 8            |
| I 5    |         | 345                 | 48             | 14           | 2           | 18/ 8/72 | 1    | 10    | 4        |                | C            | WSW         | 5            |
| I 5    |         | 378                 | 48             | 14           | 2           | 26/ 8/72 | 3    | 10    | 3        | CHEMICAL PLANT | E            | NNE         | 7            |
| I 5    |         | 397                 | 48             | 14           | 2           | 4/ 9/72  | 1    | 5     | 4        | SKUNK          | NE           | SW          | 4            |
| I 5    |         | 402                 | 48             | 14           | 2           | 6/ 9/72  | 3    | 4     | 4        | CHEMICAL ROW   |              | SSE         | 3            |
| I 5    |         | 407                 | 48             | 14           | 2           | 8/ 9/72  | 3    | 10    | 3        | REFINERY       | C            | NW          | 4            |
| I 5    |         | 416                 | 48             | 14           | 2           | 16/ 9/72 | 3    | 1     | 3        | OILY           | W            | SW          | 3            |
| I 5    |         | 439                 | 48             | 14           | 2           | 16/10/72 | 2    | 5     | 3        |                | SE           | E           | 13           |
| I 5    |         | 473                 | 48             | 14           | 2           | 28/10/72 | 1    | 10    | 3        | VINEGAR        | W            | NNE         | 3            |
| I 5    |         | 474                 | 48             | 14           | 2           | 28/10/72 | 1    | 10    | 3        | UNKNOWN        | NW           | NNE         | 3            |
| I 5    |         | 475                 | 48             | 14           | 2           | 30/10/72 | 2    | 2     | 3        |                |              | SSW         | 9            |
| I 5    |         | 477                 | 48             | 14           | 2           | 31/10/72 | 3    | 5     | 3        |                | C            | C           | 0            |
| I 5    |         | 489                 | 48             | 14           | 2           | 16/11/72 | 3    | 1     | 3        |                | C            | ESE         | 6            |
| I 5    |         | 491                 | 48             | 14           | 2           | 30/11/72 | 1    | 5     | 3        |                |              | NF          | 5            |
| I 5    |         | 492                 | 48             | 14           | 2           | 30/11/72 | 1    | 10    | 4        | UNKNOWN        | C            | NE          | 5            |
| I 5    |         | 523                 | 48             | 14           | 2           | 21/12/72 | 2    | 10    | 3        | APPLE CIDER    |              | ENE         | 6            |
| I 5    |         | 530                 | 48             | 14           | 2           | 27/12/72 | 2    | 10    | 3        | GAS            |              | ENE         | 5            |
| I 5    |         | 532                 | 48             | 14           | 2           | 27/12/72 | 2    | 4     | 4        | REFINERY       |              | FNE         | 5            |
| I 5    |         | 538                 | 48             | 14           | 2           | 28/12/72 | 1    | 4     | 4        | REFINERY       | SE           | N           | 4            |
| J 5    |         | 35                  | 49             | 15           | 2           | 30/ 3/72 | 3    | 4     | 4        | CHEMICAL PLANT | SE           | SE          | 2            |
| J 5    |         | 36                  | 49             | 15           | 2           | 31/ 3/72 | 3    | 4     | 4        |                | SE           | S           | 18           |
| J 5    |         | 59                  | 49             | 15           | 2           | 10/ 4/72 | 2    | 8     | 3        | CIL            | SW           | S           | 15           |
| J 5    |         | 85                  | 49             | 15           | 2           | 17/ 4/72 | 3    | 1     | 2        | REFINERY       |              | SW          | 7            |
| J 5    |         | 98                  | 49             | 15           | 2           | 28/ 4/72 | 1    | 1     | 3        |                | SE           | SSF         | 19           |
| J 5    |         | 102                 | 49             | 15           | 2           | 1/ 5/72  | 3    | 4     | 5        |                | E            | ESE         | 4            |
| J 5    |         | 103                 | 49             | 15           | 2           | 2/ 5/72  | 2    | 5     | 3        | SEWAGE PLANT   |              | NF          | 6            |
| J 5    |         | 106                 | 49             | 15           | 2           | 2/ 5/72  | 3    | 5     | 4        | SEWAGE PLANT   | C            | N           | 5            |
| J 5    |         | 107                 | 49             | 15           | 2           | 3/ 5/72  | 1    | 5     | 5        | SEWAGE PLANT   | N            | W           | 8            |
| J 5    |         | 108                 | 49             | 15           | 2           | 3/ 5/72  | 2    | 5     | 3        | SEWAGE PLANT   | NW           | ENE         | 5            |
| J 5    |         | 109                 | 49             | 15           | 2           | 3/ 5/72  | 2    | 5     | 5        | SEWAGE PLANT   | N            | ENE         | 5            |
| J 5    |         | 125                 | 49             | 15           | 2           | 9/ 5/72  | 1    | 10    | 5        | GAS            |              | SF          | 3            |
| J 5    |         | 134                 | 49             | 15           | 2           | 11/ 5/72 | 3    | 4     | 4        |                | SE           | NNW         | 8            |
| J 5    |         | 158                 | 49             | 15           | 2           | 24/ 5/72 | 3    | 10    | 3        | TURBO          | S            | NNW         | 10           |
| J 5    |         | 167                 | 49             | 15           | 2           | 30/ 5/72 | 3    | 4     | 4        |                | SE           | ESE         | 5            |
| J 5    |         | 176                 | 49             | 15           | 2           | 6/ 6/72  | 3    | 5     | 3        | SEWAGE PLANT   | NE           | ENE         | 10           |
| J 5    |         | 181                 | 49             | 15           | 2           | 7/ 6/72  | 3    | 4     | 4        |                | NE           | E           | 12           |
| J 5    |         | 182                 | 49             | 15           | 2           | 7/ 6/72  | 3    | 4     | 3        | REFINERY       |              | E           | 12           |
| J 5    |         | 216                 | 49             | 15           | 2           | 19/ 7/72 | 2    | 9     | 3        |                | SF           | N           | 17           |
| J 5    |         | 221                 | 49             | 15           | 2           | 21/ 7/72 | 1    | 4     | 3        |                |              | ENE         | 5            |
| J 5    |         | 229                 | 49             | 15           | 2           | 24/ 7/72 | 2    | 1     | 3        |                | F            | ESE         | 23           |
| J 5    |         | 291                 | 49             | 15           | 2           | 8/ 8/72  | 3    | 6     | 3        | SEWAGE PLANT   | SE           | WSW         | 14           |
| J 5    |         | 292                 | 49             | 15           | 2           | 8/ 8/72  | 3    | 5     | 4        | SEWAGE PLANT   | N            | WSW         | 14           |
| J 5    |         | 311                 | 49             | 15           | 2           | 11/ 8/72 | 3    | 5     | 3        | SEWAGE PLANT   | C            | NW          | 5            |
| J 5    |         | 322                 | 49             | 15           | 2           | 15/ 8/72 | 1    | 1     | 3        |                | C            | S           | 3            |
| J 5    |         | 323                 | 49             | 15           | 2           | 15/ 8/72 | 1    | 5     | 4        | SEWAGE PLANT   |              | S           | 3            |

LIST OF TELEPHONE COMPLAINTS BY GRID AREA

| CO-ORD | ADDRESS | COMPLAINT NUMBER | CONV CO-ORD | DIST AREA | DATE DMV | TIME     | TYPE | OTHER | STRENGTH | SOURCE           | RECD WIND | MFT WIND | MET SPEED |
|--------|---------|------------------|-------------|-----------|----------|----------|------|-------|----------|------------------|-----------|----------|-----------|
| J 5    |         | 335              | 49          | 15        | 2        | 17/ 8/72 | 2    | 4     | 4        | CIL              | SE        | S        | 13        |
| J 5    |         | 341              | 49          | 15        | 2        | 19/ 8/72 | 3    | 5     | 3        | SEWAGE PLANT     | E         | NNE      | 8         |
| J 5    |         | 361              | 49          | 15        | 2        | 23/ 8/72 | 3    | 5     | 4        | SEWAGE PLANT     |           | C        | 0         |
| J 5    |         | 362              | 49          | 15        | 2        | 23/ 8/72 | 3    | 5     | 5        | SEWAGE PLANT     | NE        | C        | 0         |
| J 5    |         | 363              | 49          | 15        | 2        | 23/ 8/72 | 3    | 5     | 5        | SEWAGE PLANT     |           | C        | 0         |
| J 5    |         | 364              | 49          | 15        | 2        | 23/ 8/72 | 3    | 5     | 4        | SEWAGE PLANT     |           | C        | 0         |
| J 5    |         | 365              | 49          | 15        | 2        | 23/ 8/72 | 3    | 5     | 3        | SEWAGE PLANT     |           | C        | 0         |
| J 5    |         | 369              | 49          | 15        | 2        | 24/ 8/72 | 3    | 4     | 3        | SEWAGE PLANT     | SSE       | SW       | 5         |
| J 5    |         | 372              | 49          | 15        | 2        | 25/ 8/72 | 1    | 10    | 4        | CHEMICAL ROW     |           | WNH      | 3         |
| J 5    |         | 374              | 49          | 15        | 2        | 25/ 8/72 | 2    | 5     | 3        | SEWAGE PLANT     | C         | N        | 6         |
| J 5    |         | 376              | 49          | 15        | 2        | 25/ 8/72 | 3    | 8     | 4        | CIL              |           | C        | 0         |
| J 5    |         | 388              | 49          | 15        | 2        | 29/ 8/72 | 3    | 5     | 5        | SEWER            |           | N        | 6         |
| J 5    |         | 390              | 49          | 15        | 2        | 29/ 8/72 | 3    | 5     | 3        | SEWAGE PLANT     |           | NNW      | 19        |
| J 5    |         | 394              | 49          | 15        | 2        | 1/ 9/72  | 3    | 10    | 4        | SEWAGE PLANT     |           | W        | 10        |
| J 5    |         | 406              | 49          | 15        | 2        | 8/ 9/72  | 3    | 5     | 3        | SEWAGE PLANT     | C         | NW       | 4         |
| J 5    |         | 425              | 49          | 15        | 2        | 12/10/72 | 2    | 5     | 4        | SEWAGE PLANT     | N         | NW       | 17        |
| J 5    |         | 431              | 49          | 15        | 2        | 12/10/72 | 3    | 5     | 3        | SEWAGE PLANT     |           | W        | 6         |
| J 5    |         | 438              | 49          | 15        | 2        | 16/10/72 | 2    | 4     | 3        | CIL              | SE        | E        | 13        |
| J 5    |         | 444              | 49          | 15        | 2        | 18/10/72 | 2    | 4     | 4        |                  | SE        | S        | 7         |
| J 5    |         | 452              | 49          | 15        | 2        | 19/10/72 | 3    | 5     | 3        | SEWAGE PLANT     | N         | W        | 3         |
| J 5    |         | 453              | 49          | 15        | 2        | 19/10/72 | 3    | 5     | 3        | SEWAGE PLANT     | C         | W        | 3         |
| J 5    |         | 455              | 49          | 15        | 2        | 19/10/72 | 3    | 5     | 3        | SEWAGE PLANT     | C         | W        | 3         |
| J 5    |         | 465              | 49          | 15        | 2        | 26/10/72 | 1    | 5     | 4        | SEWAGE PLANT     | NW        | NNE      | 15        |
| J 5    |         | 468              | 49          | 15        | 2        | 28/10/72 | 1    | 10    | 3        | BUILDING PRODUCT | E         | NNE      | 3         |
| J 5    |         | 470              | 49          | 15        | 2        | 29/10/72 | 1    | 10    | 4        | CHEMICAL ROW     | C         | W        | 6         |
| J 5    |         | 471              | 49          | 15        | 2        | 28/10/72 | 1    | 10    | 3        | REFINERY         | C         | NNE      | 3         |
| J 5    |         | 483              | 49          | 15        | 2        | 3/11/72  | 3    | 5     | 3        |                  | SE        | E        | 11        |
| J 5    |         | 498              | 49          | 15        | 2        | 5/12/72  | 2    | 10    | 3        | SULPHUR          |           | NW       | 7         |
| J 5    |         | 505              | 49          | 15        | 2        | 14/12/72 | 2    | 4     | 4        | CIL              | S         | SSH      | 6         |
| J 5    |         | 509              | 49          | 15        | 2        | 19/12/72 | 1    | 1     | 3        | PIPELINE         | E         | NF       | 8         |
| J 5    |         | 521              | 49          | 15        | 2        | 20/12/72 | 3    | 10    | 4        | BUILDING PRODUCT | SE        | NF       | 13        |
| J 5    |         | 534              | 49          | 15        | 2        | 27/12/72 | 2    | 10    | 3        |                  | FNE       | ENE      | 5         |
| J 5    |         | 536              | 49          | 15        | 2        | 27/12/72 | 2    | 4     | 5        | CIL              | C         | ENF      | 5         |
| K 5    |         | 224              | 50          | 15        | 1        | 21/ 7/72 | 1    | 1     | 3        | STELCO           | N         | ENE      | 5         |
| C 6    |         | 30               | 52          | 11        | 4        | 29/ 3/72 | 1    | 5     | 3        | SEWER            | E         | S        | 6         |
| F 6    |         | 211              | 54          | 12        | 3        | 16/ 7/72 | 1    | 9     | 3        | PARK MANDR       | N         | WNW      | 15        |
| F 6    |         | 225              | 54          | 12        | 3        | 22/ 7/72 | 1    | 9     | 3        | INCINERATOR      | SW        | NNE      | 8         |
| F 6    |         | 238              | 54          | 12        | 3        | 27/ 7/72 | 2    | 9     | 3        | INCINERATOR      | SC        | S        | 12        |
| F 6    |         | 259              | 54          | 12        | 3        | 31/ 7/72 | 2    | 9     | 3        |                  | C         | SC       | 12        |
| F 6    |         | 319              | 54          | 12        | 3        | 8/ 8/72  | 2    | 5     | 3        | SEWER            |           | C        | 0         |
| F 6    |         | 357              | 54          | 12        | 3        | 22/ 8/72 | 2    | 9     | 3        | INCINERATOR      | N         | W        | 7         |
| F 6    |         | 495              | 54          | 12        | 3        | 2/12/72  | 1    | 10    | 4        | GEN HOSPITAL     |           | W        | 13        |
| F 6    |         | 227              | 55          | 13        | 3        | 22/ 7/72 | 1    | 10    | 3        | REFINERY         |           | NNE      | 8         |

LIST OF TELEPHONE COMPLAINTS BY GRID AREA

| CO-ORD | ADDRESS | COMPLAINT<br>NUMBER | CONV<br>CO-ORD | DIST AREA | DATE<br>DMY | TIME     | TYPE | OTHER          | STRENGTH | SOURCE         | RECD<br>WIND | MET<br>WIND | MET<br>SPEED |
|--------|---------|---------------------|----------------|-----------|-------------|----------|------|----------------|----------|----------------|--------------|-------------|--------------|
| F 6    |         | 247                 | 55             | 13        | 3           | 28/ 7/72 | 1    | 10 UNKNOWN     | 4        | SEWER          |              | NNW         | 8            |
| F 6    |         | 285                 | 55             | 13        | 3           | 8/ 8/72  | 2    | 5              | 3        |                |              | C           | 0            |
| F 6    |         | 331                 | 55             | 13        | 3           | 16/ 8/72 | 3    | 10 BURNING     | 3        |                |              | C           | 0            |
| F 6    |         | 420                 | 55             | 13        | 3           | 9/10/72  | 2    | 2              | 3        |                | NW           | NW          | 22           |
| F 6    |         | 428                 | 55             | 13        | 3           | 12/10/72 | 3    | 5              | 3        |                | N            | N           | 6            |
| G 6    |         | 1                   | 56             | 13        | 2           | 27/ 3/72 | 2    | 6              | 3        | GAINERS        |              | FSF         | 7            |
| G 6    |         | 122                 | 56             | 13        | 2           | 8/ 5/72  | 2    | 6              | 4        | GAINERS        | S            | SE          | 8            |
| G 6    |         | 513                 | 56             | 13        | 2           | 20/12/72 | 2    | 4              | 3        | CHEMICAL PLANT | C            | SSW         | 14           |
| G 6    |         | 524                 | 56             | 13        | 2           | 21/12/72 | 2    | 4              | 4        | CHEMCELL       |              | ENE         | 6            |
| H 6    |         | 56                  | 57             | 14        | 2           | 8/ 4/72  | 3    | 1              | 4        | REFINERY       |              | NE          | 7            |
| H 6    |         | 71                  | 57             | 14        | 2           | 17/ 4/72 | 3    | 6              | 3        | GAINERS        | SW           | SW          | 7            |
| H 6    |         | 111                 | 57             | 14        | 2           | 5/ 5/72  | 2    | 4              | 3        |                | E            | ENE         | 14           |
| H 6    |         | 179                 | 57             | 14        | 2           | 7/ 6/72  | 1    | 4              | 3        | CHEMICAL PLANT | E            | ENE         | 12           |
| H 6    |         | 196                 | 57             | 14        | 2           | 2/ 7/72  | 1    | 10 GAS         | 3        |                | C            | NW          | 6            |
| H 6    |         | 395                 | 57             | 14        | 2           | 2/ 9/72  | 1    | 2              | 3        |                | NNW          | N           | 7            |
| H 6    |         | 533                 | 57             | 14        | 2           | 27/12/72 | 2    | 4              | 3        |                | E            | ENE         | 5            |
| H 6    |         | 535                 | 57             | 14        | 2           | 27/12/72 | 3    | 10 UNKNOWN     | 3        |                | NE           | ENE         | 3            |
| I 6    |         | 77                  | 58             | 14        | 2           | 20/ 4/72 | 3    | 4              | 4        | REFINERY       | E            | ENE         | 21           |
| I 6    |         | 78                  | 58             | 14        | 2           | 20/ 4/72 | 2    | 4              | 4        | CHEMICAL PLANT | SE           | E           | 10           |
| I 6    |         | 178                 | 58             | 14        | 2           | 6/ 6/72  | 3    | 8              | 5        | CIL            | E            | ENE         | 10           |
| I 6    |         | 232                 | 58             | 14        | 2           | 24/ 7/72 | 3    | 10 OIL         | 4        |                | SE           | F           | 8            |
| I 6    |         | 273                 | 58             | 14        | 2           | 3/ 8/72  | 2    | 10 UNKNOWN     | 5        |                | E            | NW          | 5            |
| I 6    |         | 295                 | 58             | 14        | 2           | 9/ 8/72  | 3    | 10 OIL         | 3        | CHEMICAL PLANT | SE           | WSW         | 3            |
| I 6    |         | 298                 | 58             | 14        | 2           | 10/ 8/72 | 1    | 1              | 3        | REFINERY       | SE           | E           | 8            |
| I 6    |         | 302                 | 58             | 14        | 2           | 10/ 8/72 | 1    | 10             | 4        | CIL            | E            | F           | 8            |
| I 6    |         | 413                 | 58             | 14        | 2           | 12/ 9/72 | 3    | 2              | 4        |                | E            | NW          | 5            |
| I 6    |         | 469                 | 58             | 14        | 2           | 28/10/72 | 1    | 4              | 3        |                | C            | NNF         | 3            |
| I 6    |         | 472                 | 58             | 14        | 2           | 28/10/72 | 1    | 8              | 4        | CHEMCELL       | ENE          | NNE         | 3            |
| I 6    |         | 493                 | 58             | 14        | 2           | 30/11/72 | 1    | 4              | 4        | CHEMICAL PLANT | NNE          | NE          | 5            |
| I 6    |         | 510                 | 58             | 14        | 2           | 21/12/72 | 3    | 4              | 4        | PLANT          | SW           | N           | 12           |
| I 6    |         | 528                 | 58             | 14        | 2           | 27/12/72 | 2    | 4              | 5        | CIL            | C            | ENE         | 5            |
| K 6    |         | 137                 | 60             | 15        | 2           | 12/ 5/72 | 2    | 4              | 3        | TURBO          | NW           | NW          | 5            |
| R 7    |         | 4                   | 61             | 16        | 4           | 27/ 3/72 | 2    | 1              | 4        |                |              | FSF         | 7            |
| R 7    |         | 264                 | 61             | 16        | 4           | 1/ 8/72  | 2    | 5              | 3        |                |              | N           | 10           |
| R 7    |         | 312                 | 61             | 16        | 4           | 11/ 8/72 | 3    | 10 FOUL ANIMAL | 3        | FEED LOT       | C            | NW          | 5            |
| R 7    |         | 496                 | 61             | 16        | 4           | 3/12/72  | 2    | 5              | 3        |                |              | W           | 13           |
| R 7    |         | 507                 | 61             | 16        | 4           | 15/12/72 | 2    | 5              | 3        | SEWER          |              | FSF         | 6            |
| C 7    |         | 260                 | 62             | 16        | 4           | 31/ 7/72 | 2    | 5              | 3        | SEWER          |              | SSF         | 12           |
| C 7    |         | 284                 | 62             | 16        | 4           | 8/ 5/72  | 2    | 5              | 4        |                |              | C           | 0            |
| C 7    |         | 435                 | 62             | 16        | 4           | 14/10/72 | 1    | 5              | 3        |                |              | SSW         | 7            |

LIST OF TELEPHONE COMPLAINTS BY GRID AREA

| CO-ORD | ADDRESS | COMPLAINT NUMBER | CONV CO-ORD | DIST | AREA | DATE DMY | TIME | TYPE | OTHER                  | STRENGTH | SOURCE          | WIND | WIND SPEED | MT |
|--------|---------|------------------|-------------|------|------|----------|------|------|------------------------|----------|-----------------|------|------------|----|
| D 7    |         | 99               | 63          | 17   | 4    | 28/ 4/72 | 3    | 10   | BURNING LEAVES         | 5        | FIREGLAS        | C    | SW         | 7  |
| D 7    |         | 124              | 63          | 17   | 4    | 9/ 5/72  | 1    | 4    |                        | 3        |                 |      | SE         | 3  |
| F 7    |         | 12               | 64          | 17   | 4    | 28/ 3/72 | 1    | 9    |                        | 4        | INCINERATOR     | N    | C          | 0  |
| F 7    |         | 51               | 64          | 17   | 4    | 7/ 4/72  | 2    | 4    |                        | 3        | CHEMICAL PLANT  | E    | ENE        | 6  |
| F 7    |         | 83               | 64          | 17   | 4    | 23/ 4/72 | 2    | 4    |                        | 3        | REFINERY        | F    | ENE        | 11 |
| F 7    |         | 189              | 64          | 17   | 4    | 9/ 6/72  | 3    | 6    |                        | 3        | PACKING PLANT   | S    | SE         | 11 |
| F 7    |         | 236              | 64          | 17   | 4    | 25/ 7/72 | 3    | 10   |                        | 3        | NEIGHBOUR       | NE   | E          | 8  |
| F 7    |         | 324              | 64          | 17   | 4    | 15/ 8/72 | 2    | 9    | WEED KILLER<br>GARBAGE | 3        | BATEMAN'S IGA   | SSE  | SSW        | 6  |
| F 7    |         | 326              | 64          | 17   | 4    | 15/ 8/72 | 2    | 9    |                        | 3        | BATEMAN'S IGA   | SE   | SSW        | 6  |
| F 7    |         | 366              | 64          | 17   | 4    | 24/ 8/72 | 2    | 8    |                        | 3        | BATEMAN'S IGA   | SE   | S          | 6  |
| F 7    |         | 409              | 64          | 17   | 4    | 10/ 9/72 | 3    | 10   | BURNING LEAVES         | 4        | INCINERATOR     | C    | S          | 9  |
| F 7    |         | 457              | 64          | 17   | 4    | 20/10/72 | 2    | 9    |                        | 3        |                 |      | NE         | 9  |
| F 7    |         | 539              | 64          | 17   | 4    | 28/12/72 | 1    | 9    |                        | 3        |                 | C    | N          | 4  |
| F 7    |         | 73               | 65          | 18   | 4    | 18/ 4/72 | 2    | 10   | YEASTY                 | 3        | OKEEFE BREWERY  | NNW  | C          | 0  |
| F 7    |         | 183              | 65          | 18   | 4    | 8/ 6/72  | 1    | 4    |                        | 3        | CHEMICAL ROW    | E    | ENC        | 12 |
| F 7    |         | 253              | 65          | 18   | 4    | 28/ 7/72 | 3    | 1    | SKUNK                  | 3        |                 | NE   | W          | 8  |
| F 7    |         | 254              | 65          | 18   | 4    | 29/ 7/72 | 3    | 10   |                        | 3        | PROPANE BOTTLES | SE   | W          | 6  |
| F 7    |         | 280              | 65          | 18   | 4    | 4/ 8/72  | 3    | 6    |                        | 3        | GAINERS         | ESE  | SSW        | 12 |
| F 7    |         | 327              | 65          | 18   | 4    | 15/ 8/72 | 2    | 6    |                        | 3        | GAINERS         | NE   | SSW        | 6  |
| F 7    |         | 367              | 65          | 18   | 4    | 22/ 8/72 | 3    | 10   | SKUNK                  | 3        |                 | NE   | NNW        | 10 |
| F 7    |         | 373              | 65          | 19   | 4    | 25/ 8/72 | 1    | 10   |                        | 3        |                 | SE   | NNW        | 3  |
| F 7    |         | 379              | 65          | 18   | 4    | 26/ 8/72 | 3    | 10   | SKUNK                  | 3        |                 | NE   | NNF        | 7  |
| G 7    |         | 16               | 66          | 18   | 2    | 28/ 3/72 | 1    | 6    |                        | 5        | GAINERS         | S    | C          | 0  |
| G 7    |         | 20               | 66          | 18   | 2    | 28/ 3/72 | 2    | 6    |                        | 3        | STOCK YARDS     | SE   | NNW        | 4  |
| G 7    |         | 43               | 66          | 18   | 2    | 5/ 4/72  | 2    | 6    |                        | 4        | GAINERS         | E    | C          | 16 |
| G 7    |         | 58               | 66          | 18   | 2    | 9/ 4/72  | 2    | 6    |                        | 4        | GAINERS         | S    | N          | 7  |
| G 7    |         | 60               | 66          | 18   | 2    | 10/ 4/72 | 2    | 6    |                        | 3        | GAINERS         | SSE  | S          | 15 |
| G 7    |         | 70               | 66          | 18   | 2    | 17/ 4/72 | 3    | 6    |                        | 3        | GAINERS         | S    | SW         | 7  |
| G 7    |         | 74               | 66          | 18   | 2    | 18/ 4/72 | 1    | 6    |                        | 3        | GAINERS         | NNW  | N          | 14 |
| G 7    |         | 82               | 66          | 18   | 2    | 21/ 4/72 | 1    | 6    |                        | 5        | GAINERS         | N    | ENE        | 13 |
| G 7    |         | 90               | 66          | 18   | 2    | 27/ 4/72 | 2    | 6    |                        | 3        | GAINERS         | SE   | S          | 14 |
| G 7    |         | 118              | 66          | 18   | 2    | 6/ 5/72  | 2    | 6    |                        | 3        | GAINERS         | S    | S          | 10 |
| G 7    |         | 145              | 66          | 18   | 2    | 17/ 5/72 | 3    | 6    |                        | 3        | GAINERS         | SE   | NNF        | 6  |
| G 7    |         | 153              | 66          | 18   | 2    | 23/ 5/72 | 3    | 6    |                        | 5        | GAINERS         | SE   | S          | 5  |
| G 7    |         | 156              | 66          | 18   | 2    | 23/ 5/72 | 3    | 6    |                        | 4        | GAINERS         | SE   | SE         | 5  |
| G 7    |         | 157              | 66          | 18   | 2    | 24/ 5/72 | 1    | 6    |                        | 4        | GAINERS         | NNW  | SE         | 5  |
| G 7    |         | 161              | 66          | 18   | 2    | 24/ 5/72 | 3    | 6    |                        | 4        | GAINERS         | NNW  | SE         | 5  |
| G 7    |         | 170              | 66          | 18   | 2    | 31/ 5/72 | 3    | 6    |                        | 4        | GAINERS         | S    | NN         | 10 |
| G 7    |         | 180              | 66          | 18   | 2    | 7/ 6/72  | 1    | 6    |                        | 5        | GAINERS         | SSE  | NN         | 19 |
| G 7    |         | 219              | 66          | 18   | 2    | 20/ 7/72 | 1    | 6    |                        | 3        | GAINERS         | E    | NN         | 12 |
| G 7    |         | 230              | 66          | 18   | 2    | 24/ 7/72 | 2    | 6    |                        | 4        | GAINERS         | E    | NN         | 5  |
| G 7    |         | 231              | 66          | 18   | 2    | 24/ 7/72 | 2    | 6    |                        | 3        | GAINERS         | E    | NN         | 23 |
| G 7    |         | 233              | 66          | 18   | 2    | 24/ 7/72 | 2    | 6    |                        | 3        | GAINERS         | E    | NN         | 23 |
| G 7    |         | 234              | 66          | 18   | 2    | 24/ 7/72 | 2    | 6    |                        | 3        | GAINERS         | E    | NN         | 23 |

LIST OF TELEPHONE COMPLAINTS BY GRID AREA

| CO-ORD | ADDRESS | COMPLAINT<br>NUMBER | CONV<br>CO-ORD | DIST | AREA | DATE<br>DMY | TIME | TYPE | OTHR           | STRENGTH | SOURCE         | RFC<br>WIND | MTT<br>WIND | MTT<br>SPEED |
|--------|---------|---------------------|----------------|------|------|-------------|------|------|----------------|----------|----------------|-------------|-------------|--------------|
| G 7    |         | 235                 | 66             | 18   | 2    | 24/ 7/72    | 2    | 6    |                | 3        | GAINERS        | NE          | FSC         | 23           |
| G 7    |         | 244                 | 66             | 18   | 2    | 27/ 7/72    | 2    | 6    |                | 4        | GAINERS        | NF          | S           | 12           |
| G 7    |         | 250                 | 66             | 18   | 2    | 28/ 7/72    | 2    | 6    |                | 5        | GAINERS        | SE          | WSF         | 13           |
| G 7    |         | 267                 | 66             | 18   | 2    | 31/ 7/72    | 3    | 6    |                | 3        | GAINERS        | SE          | WNW         | 7            |
| G 7    |         | 278                 | 66             | 18   | 2    | 31/ 8/72    | 3    | 6    |                | 4        | GAINERS        | SE          | SW          | 6            |
| G 7    |         | 286                 | 66             | 18   | 2    | 8/ 8/72     | 2    | 6    |                | 3        | GAINERS        | E           | C           | 0            |
| G 7    |         | 287                 | 66             | 18   | 2    | 8/ 8/72     | 2    | 6    |                | 3        | GAINERS        | C           | C           | 0            |
| G 7    |         | 288                 | 66             | 18   | 2    | 8/ 8/72     | 2    | 6    |                | 3        | GAINERS        | SE          | C           | 0            |
| G 7    |         | 303                 | 66             | 18   | 2    | 10/ 8/72    | 1    | 6    |                | 5        | GAINERS        | E           | E           | 8            |
| G 7    |         | 305                 | 66             | 18   | 2    | 10/ 8/72    | 2    | 6    |                | 4        | GAINERS        | NE          | ENF         | 11           |
| G 7    |         | 306                 | 66             | 18   | 2    | 10/ 8/72    | 2    | 6    |                | 3        | GAINERS        | E           | ENE         | 11           |
| G 7    |         | 307                 | 66             | 18   | 2    | 10/ 8/72    | 2    | 6    |                | 3        | GAINERS        | E           | ENF         | 11           |
| G 7    |         | 310                 | 66             | 18   | 2    | 11/ 8/72    | 1    | 6    |                | 3        | GAINERS        | E           | N           | 8            |
| G 7    |         | 338                 | 66             | 18   | 2    | 18/ 8/72    | 3    | 6    |                | 5        | GAINERS        | S           | S           | 4            |
| G 7    |         | 347                 | 66             | 18   | 2    | 21/ 8/72    | 2    | 6    |                | 4        | GAINERS        | S           | S           | 14           |
| G 7    |         | 354                 | 66             | 18   | 2    | 21/ 8/72    | 3    | 6    |                | 3        | GAINERS        | C           | S           | 12           |
| G 7    |         | 358                 | 66             | 18   | 2    | 23/ 8/72    | 1    | 5    |                | 3        | SEWER          |             |             | 8            |
| G 7    |         | 430                 | 66             | 18   | 2    | 13/10/72    | 1    | 5    |                | 4        | SEWER          | N           | N           | 17           |
| G 7    |         | 462                 | 66             | 18   | 2    | 24/10/72    | 3    | 6    |                | 4        | GAINERS        | SW          | SW          | 8            |
| G 7    |         | 522                 | 66             | 18   | 2    | 20/12/72    | 3    | 10   | SULPHUR        | 4        | CHEMICAL ROW   | E           | NF          | 13           |
| G 7    |         | 537                 | 66             | 18   | 2    | 27/12/72    | 1    | 10   | SULPHUR        | 4        | CHEMICAL ROW   | WSW         | WSW         | 7            |
| * G 7  |         | 417                 | 66             | 18   | 2    | 16/9/72     | 3    | 4    |                | 4        | CHEMICAL ROW   | SW          | SW          | 3            |
| H 7    |         | 72                  | 67             | 19   | 2    | 17/ 4/72    | 3    | 6    |                | 3        | GAINERS        | SW          | SW          | 7            |
| H 7    |         | 162                 | 67             | 19   | 2    | 27/ 5/72    | 2    | 4    |                | 4        | GAINERS        | NE          | SE          | 4            |
| H 7    |         | 237                 | 67             | 19   | 2    | 25/ 7/72    | 3    | 6    |                | 5        | GAINERS        | E           | E           | 8            |
| H 7    |         | 255                 | 67             | 19   | 2    | 31/ 7/72    | 2    | 10   | RUBBER         | 3        | SAFEGWAY       | SE          | SSE         | 12           |
| H 7    |         | 514                 | 67             | 19   | 2    | 20/12/72    | 2    | 4    |                | 4        |                | C           | SSW         | 14           |
| H 7    |         | 516                 | 67             | 19   | 2    | 20/12/72    | 3    | 4    |                | 2        | REFINERY       | NE          | NF          | 13           |
| H 7    |         | 517                 | 67             | 19   | 2    | 20/12/72    | 3    | 4    |                | 4        | CHEMICAL ROW   | E           | NF          | 13           |
| I 7    |         | 54                  | 68             | 19   | 2    | 8/ 4/72     | 3    | 4    |                | 3        | CHEMICAL PLANT | NE          | NF          | 7            |
| I 7    |         | 412                 | 68             | 19   | 2    | 11/ 9/72    | 2    | 10   | BURNING RUBBER | 5        |                | C           | NW          | 5            |
| I 7    |         | 426                 | 68             | 19   | 2    | 12/10/72    | 3    | 5    |                | 4        | SEWER          | NE          | N           | 6            |
| I 7    |         | 518                 | 68             | 19   | 2    | 20/12/72    | 3    | 4    |                | 3        | CHEMICAL ROW   | NE          | NF          | 13           |
| K 7    |         | 433                 | 70             | 20   | 2    | 13/10/72    | 3    | 4    |                | 3        | CHEMICAL ROW   | NW          | SSW         | 6            |
| B 8    |         | 346                 | 71             | 16   | 4    | 20/ 8/72    | 2    | 5    |                | 4        | SEWER          |             | NF          | 7            |
| B 8    |         | 436                 | 71             | 16   | 4    | 14/10/72    | 2    | 5    |                | 3        | SEWER          |             | WSW         | 13           |
| C 8    |         | 316                 | 72             | 16   | 4    | 14/ 8/72    | 2    | 1    |                | 4        |                | W           | S           | 8            |
| D 8    |         | 410                 | 73             | 17   | 4    | 10/ 9/72    | 3    | 10   | BURNING        | 3        |                |             | S           | 8            |
| D 8    |         | 422                 | 73             | 17   | 4    | 12/10/72    | 1    | 1    |                | 3        | SEWER          |             | SW          | 7            |

\* See G-3 for additional G-7 complaints that were miscoded.



LIST OF TELEPHONE COMPLAINTS BY GRID AREA

| CO-ORD | ADDRESS | COMPLAINT NUMBER | CONV CO-ORD | DIST AREA | DATE DMY | TIME     | TYPE | QTHP | STRENGTH | SOURCE            | RCD WIND | MFT WIND | NET SPEED |
|--------|---------|------------------|-------------|-----------|----------|----------|------|------|----------|-------------------|----------|----------|-----------|
| F 8    |         | 52               | 74          | 17        | 4        | 8/ 4/72  | 3    | 4    | 4        | CHEMICAL PLANT    | E        | NE       | 7         |
| F 8    |         | 175              | 74          | 17        | 4        | 6/ 6/72  | 3    | 4    | 4        | CHEMICAL PLANT    | ENE      | FNE      | 10        |
| F 8    |         | 177              | 74          | 17        | 4        | 6/ 6/72  | 3    | 4    | 4        | CHEMICAL PLANT    | F        | FNF      | 10        |
| F 8    |         | 190              | 74          | 17        | 4        | 10/ 6/72 | 1    | 1    | 3        |                   | C        | S        | 6         |
| E 8    |         | 210              | 74          | 17        | 4        | 15/ 7/72 | 3    | 10   | 3        | UKRAINIAN COOKERY | H        | NW       | 16        |
| F 8    |         | 529              | 74          | 17        | 4        | 27/12/72 | 2    | 4    | 3        | CHEMICAL PLANT    | E        | ENF      | 5         |
| F 8    |         | 13               | 75          | 18        | 4        | 28/ 3/72 | 1    | 4    | 3        |                   | C        | C        | 0         |
| F 8    |         | 268              | 75          | 18        | 4        | 2/ 8/72  | 3    | 2    | 3        |                   | C        | SSW      | 5         |
| F 8    |         | 423              | 75          | 18        | 4        | 12/10/72 | 1    | 10   | 4        |                   | C        | SW       | 7         |
| G 8    |         | 47               | 76          | 18        | 2        | 6/ 4/72  | 2    | 6    | 3        | GAINERS           | N        | NNE      | 14        |
| G 8    |         | 62               | 76          | 18        | 2        | 11/ 4/72 | 2    | 6    | 3        | GAINERS           | N        | S        | 6         |
| G 8    |         | 63               | 76          | 18        | 2        | 12/ 4/72 | 1    | 6    | 3        | GAINERS           | N        | NNW      | 6         |
| G 8    |         | 146              | 76          | 18        | 2        | 17/ 5/72 | 1    | 6    | 4        | GAINERS           | N        | E        | 7         |
| G 8    |         | 203              | 76          | 18        | 2        | 13/ 7/72 | 2    | 6    | 5        | GAINERS           | N        | NNW      | 20        |
| G 8    |         | 205              | 76          | 18        | 2        | 12/ 7/72 | 2    | 6    | 8        | GAINERS           | N        | S        | 8         |
| G 8    |         | 308              | 76          | 18        | 2        | 10/ 8/72 | 3    | 6    | 5        | GAINERS           | NW       | N        | 12        |
| G 8    |         | 519              | 76          | 18        | 2        | 20/12/72 | 3    | 4    | 3        | CHEMICAL PLANT    | C        | NE       | 13        |
| G 8    |         | 520              | 76          | 18        | 2        | 20/12/72 | 3    | 4    | 3        |                   | NE       | NE       | 13        |
| H 8    |         | 147              | 77          | 19        | 2        | 22/ 5/72 | 3    | 10   | 5        | CHEMICAL PLANT    | SE       | NW       | 5         |
| H 8    |         | 525              | 77          | 19        | 2        | 21/12/72 | 2    | 4    | 5        | CHEMICAL ROW      | E        | FNE      | 6         |
| H 8    |         | 540              | 77          | 19        | 2        | 28/12/72 | 2    | 10   | 5        |                   |          | NF       | 2         |
| K 8    |         | 446              | 80          | 20        | 2        | 19/10/72 | 2    | 10   | 5        | FARM              | NNW      | NNW      | 13        |
| F 9    |         | 396              | 84          | 22        | 4        | 3/ 9/72  | 1    | 10   | 3        | UNIV FARM         | C        | NNW      | 11        |
| F 9    |         | 497              | 84          | 22        | 4        | 4/12/72  | 2    | 5    | 4        | UNIV FARM         |          | NNW      | 7         |
| F 9    |         | 511              | 84          | 22        | 4        | 20/12/72 | 1    | 5    | 3        |                   |          | SW       | 4         |
| F 9    |         | 50               | 85          | 23        | 4        | 6/ 4/72  | 3    | 5    | 4        | SEWER             |          | S        | 6         |
| D 10   |         | 411              | 93          | 22        | 4        | 10/ 9/72 | 2    | 5    | 3        | SEWER             |          | NNW      | 12        |
| F 10   |         | 144              | 94          | 22        | 4        | 17/ 5/72 | 1    | 1    | 3        |                   | C        | E        | 7         |
| F 10   |         | 149              | 94          | 22        | 4        | 23/ 5/72 | 3    | 10   | 3        |                   |          | SE       | 5         |
| F 10   |         | 266              | 94          | 22        | 4        | 2/ 8/72  | 3    | 9    | 3        | SAVAGE CLINIC     | NW       | SSW      | 5         |
| F 10   |         | 418              | 94          | 22        | 4        | 2/10/72  | 1    | 1    | 3        |                   | C        | S        | 4         |
| F 10   |         | 448              | 94          | 22        | 4        | 19/10/72 | 2    | 5    | 3        | SEWER             |          | NNW      | 13        |

LIST OF TELEPHONE COMPLAINTS BY GRID AREA

| CO-ORD | ADDRESS | COMPLAINT NUMBER | CONV CO-ORD | DIST AREA | DATE DMV | TIME     | TYPE | OTHER             | STRENGTH | SOURCE         | PECO WIND | MET WIND | MET SPEED |
|--------|---------|------------------|-------------|-----------|----------|----------|------|-------------------|----------|----------------|-----------|----------|-----------|
| F 10   |         | 49               | 95          | 23        | 4        | 6/ 4/72  | 3    | 10 GAS            | 4        | DOVE           | S         | S        | 6         |
| F 10   |         | 485              | 95          | 23        | 4        | 10/11/72 | 2    | 10 SMOKE          | 3        | CONSTRUCTION   | SSE       | SSE      | 10        |
| K 10   |         | 27               | 100         | 25        | 2        | 28/ 3/72 | 3    | 10 MANURE         | 4        | FARM           | E         | S        | 5         |
| K 10   |         | 408              | 100         | 25        | 2        | 8/ 9/72  | 3    | 10 UNKNOWN        | 3        | CHEMICAL PLANT | NE        | NW       | 4         |
| A 1    |         | 25               | 101         | 26        | 5        | 29/ 3/72 | 2    | 1 METALLIC        | 5        |                | SSE       | SSE      | 8         |
| A 1    |         | 159              | 101         | 26        | 5        | 25/ 5/72 | 1    | 10 FOWL ANIMAL    | 4        |                | SW        | NNW      | 10        |
| A 1    |         | 389              | 101         | 26        | 5        | 29/ 8/72 | 2    | 10                | 3        | FARM           | SE        | N        | 6         |
| S 7    |         | 11               | 102         | 27        | 6        | 28/ 3/72 | 1    | 4 GAS             | 3        |                | NW        | C        | 0         |
| S 7    |         | 28               | 102         | 27        | 6        | 28/ 3/72 | 3    | 10                | 3        | DDMF           | NW        | S        | 5         |
| S 7    |         | 53               | 102         | 27        | 6        | 8/ 4/72  | 3    | 4                 | 3        | FIBERGLAS      | NW        | NE       | 7         |
| S 7    |         | 76               | 102         | 27        | 6        | 20/ 4/72 | 2    | 4                 | 4        | CHEMICAL PLANT | C         | E        | 10        |
| S 7    |         | 100              | 102         | 27        | 6        | 30/ 4/72 | 1    | 10 MATCHES        | 3        |                | W         | NA       | 17        |
| S 7    |         | 110              | 102         | 27        | 6        | 5/ 5/72  | 2    | 4                 | 3        | FIBERGLAS      | NE        | ENE      | 14        |
| S 7    |         | 132              | 102         | 27        | 6        | 11/ 5/72 | 2    | 4                 | 3        | FIBERGLAS      | NE        | ENE      | 3         |
| S 7    |         | 148              | 102         | 27        | 6        | 23/ 5/72 | 1    | 4                 | 3        | FIBERGLAS      | NNW       | NNW      | 11        |
| S 7    |         | 200              | 102         | 27        | 6        | 13/ 7/72 | 3    | 4                 | 3        | REFINERY       | W         | W        | 7         |
| S 7    |         | 202              | 102         | 27        | 6        | 15/ 7/72 | 2    | 4                 | 4        | CHEMICAL ROW   | NW        | N        | 14        |
| S 7    |         | 207              | 102         | 27        | 6        | 15/ 7/72 | 2    | 10 GAS            | 3        | CHEMCELL       | NW        | N        | 14        |
| S 7    |         | 226              | 102         | 27        | 6        | 22/ 7/72 | 1    | 1                 | 4        | REFINERY       | C         | NNE      | 8         |
| S 7    |         | 359              | 102         | 27        | 6        | 23/ 8/72 | 2    | 10 OIL            | 3        | REFINERY       | S         | S        | 4         |
| S 7    |         | 415              | 102         | 27        | 6        | 16/ 9/72 | 2    | 10 UNKNOWN        | 5        | CHEMICAL ROW   | NNW       | NNW      | 21        |
| S 7    |         | 419              | 102         | 27        | 6        | 3/10/72  | 1    | 4                 | 5        |                | N         | NNW      | 8         |
| S 7    |         | 427              | 102         | 27        | 6        | 12/10/72 | 3    | 1                 | 3        | REFINERY       | N         | N        | 6         |
| S 7    |         | 432              | 102         | 27        | 6        | 13/10/72 | 1    | 4                 | 4        |                | NE        | N        | 17        |
| S 7    |         | 434              | 102         | 27        | 6        | 13/10/72 | 3    | 10 BURNING RUBBER | 4        | CHEMICAL ROW   | S         | SSW      | 6         |
| S 7    |         | 447              | 102         | 27        | 6        | 19/10/72 | 2    | 4                 | 3        |                | C         | NNW      | 13        |
| S 7    |         | 451              | 102         | 27        | 6        | 19/10/72 | 2    | 4                 | 3        |                | W         | W        | 3         |
| S 7    |         | 463              | 102         | 27        | 6        | 31/10/72 | 1    | 4                 | 3        | CHEMICAL ROW   | NW        | E        | 5         |
| S 7    |         | 464              | 102         | 27        | 6        | 26/10/72 | 1    | 1                 | 4        | PLANT          | NW        | NNE      | 15        |
| S 7    |         | 479              | 102         | 27        | 6        | 15/10/72 | 1    | 1                 | 4        |                | NW        | NNE      | 15        |
| S 7    |         | 481              | 102         | 27        | 6        | 2/11/72  | 3    | 4                 | 4        | REFINERY       | NW        | NNW      | 8         |
| S 7    |         | 488              | 102         | 27        | 6        | 14/11/72 | 2    | 4                 | 5        | REFINERY       | NW        | NNW      | 8         |
| S 7    |         | 500              | 102         | 27        | 6        | 8/12/72  | 2    | 1                 | 3        | REFINERY       | NW        | NNW      | 7         |
| S 7    |         | 501              | 102         | 27        | 6        | 8/12/72  | 2    | 3                 | 3        | GULF REFINERY  | NW        | NNW      | 6         |
| S 7    |         | 502              | 102         | 27        | 6        | 11/12/72 | 2    | 4                 | 3        | REFINERY       | NW        | NNW      | 6         |
| S 7    |         | 508              | 102         | 27        | 6        | 16/12/72 | 2    | 4                 | 3        | FIBERGLAS      | N         | N        | 14        |
| S 7    |         | 527              | 102         | 27        | 6        | 23/12/72 | 2    | 4                 | 4        | FIBERGLAS      | N         | N        | 14        |
| S 7    |         | 541              | 102         | 27        | 6        | 23/12/72 | 3    | 10 UNKNOWN        | 4        |                | NA        | SF       | 12        |
| S 7    |         | 542              | 102         | 27        | 6        | 30/12/72 | 3    | 10 UNKNOWN        | 4        |                | N         | NW       | 4         |
| S 7    |         |                  | 102         | 27        | 6        | 30/12/72 | 3    | 1                 | 3        |                | NW        | NW       | 4         |

## MISCELLANEOUS FORMS

# ODOUR OCCURRENCE SURVEY OF EDMONTON AREA

# ODOUR OCCURRENCE SURVEY OF EDMONTON AREA

Location of Sampling Station

[illegible]

TYPE OF ODOUR

6. Meat Processing
7. Wood Smoke
8. Plastic
9. Burning Garbage
10. Other (describe)

RECORDING SCHEDULE: Check off conditions once every 8 hours on regular basis and the times of noticeable changes if possible.

**SAMPLING INSTRUCTIONS:** Avoid making observations at a point such as curbside where very local, normal odour conditions (sewer manhole, car gasoline, etc.) will affect the odour.

Stanley Associates Engineering Ltd., 11748 Kingsway Ave., Edmonton Alta. 453.3441

Sample of Advertisement  
from The Edmonton Journal

**ODOUR COMPLAINTS  
PHONE 455-6944**

In connection with a study being conducted for the Alberta Department of the Environment, Stanley Associates Engineering Ltd. is receiving, recording and analysing complaints of odours in the Edmonton area. An automatic telephone recording system is being used and the caller should be prepared to supply the following information after the recorded message is heard: name and address, date and hour of odour occurrence, type of odour, wind direction and suspected source.

Anyone wishing to make a more detailed odour complaint or supply additional information should write to

**Stanley Associates Engineering Ltd.**  
11748 Kingsway Ave., Edmonton 19, Alberta (Odour Survey)



# Sample Form

EDMONTON AREA ODOUR SURVEY 1972

**appendix b-3**

## TELEPHONED COMPLAINT

SAEL  
CODE

COMPLAINANT: \_\_\_\_\_ DATE: \_\_\_\_\_ 19\_\_ \_\_\_\_\_

ADDRESS: \_\_\_\_\_ TIME: \_\_\_\_\_  
\_\_\_\_\_

TIME OF ODOUR OCCURRENCE: \_\_\_\_\_

TYPE OF ODOUR: \_\_\_\_\_

STRENGTH OF ODOUR: \_\_\_\_\_

WIND DIRECTION: \_\_\_\_\_

SUSPECTED SOURCE: \_\_\_\_\_

OTHER REMARKS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

COMPLAINT RECEIVED BY: \_\_\_\_\_

## appendix b-4

## MEANING OF NUMERICAL CODES IN COMPUTER PRINTOUT

| A. <u>Types of Odors</u> | <u>Code</u> |
|--------------------------|-------------|
|--------------------------|-------------|

|                 |    |
|-----------------|----|
| Rotten Eggs     | 1  |
| Exhaust Fumes   | 2  |
| Tar             | 3  |
| Chemical        | 4  |
| Sewage          | 5  |
| Meat Processing | 6  |
| Wood Smoke      | 7  |
| Plastic         | 8  |
| Burning Garbage | 9  |
| Other           | 10 |

### B. Strength of Odors

|                   |   |
|-------------------|---|
| None              | 1 |
| Barely noticeable | 2 |
| Quite noticeable  | 3 |
| Very noticeable   | 4 |
| Extremely strong  | 5 |

## C. Time of Day

| <u>Code</u>   | <u>Telephone<br/>Complaints</u> | <u>House and Fire Hall<br/>Survey</u> |
|---------------|---------------------------------|---------------------------------------|
| 1 - Morning   | 4 a.m. - noon                   | 8 a.m.                                |
| 2 - Afternoon | noon - 8 p.m.                   | 4 p.m.                                |
| 3 - Evening   | 8 p.m. - 4 a.m.                 | 12 midnight                           |

#### D. Wind Direction

|      |        |      |       |      |       |
|------|--------|------|-------|------|-------|
| 0.   | - Calm |      |       |      |       |
| 0.25 | - NNE  | 1.25 | - ESE | 2.25 | - SSW |
| 0.5  | - NE   | 1.5  | - SE  | 2.5  | - SW  |
| 0.75 | - ENE  | 1.75 | - SSE | 2.75 | - WSW |
| 1.0  | - E    | 2.0  | - S   | 3.0  | - W   |
|      |        |      |       | 3.25 | - WNW |
|      |        |      |       | 3.5  | - NW  |
|      |        |      |       | 3.75 | - NNW |
|      |        |      |       | 4.0  | - N   |



